



LOUISIANA'S  
**Nonpoint Source  
Pollution Unit**



# 2007 Annual Report



Cover Page Photo: Bluebonnet Swamp  
Photographer: John Hartgerink



# Preface

In order to stimulate efforts to improve water quality in Louisiana, Governor Blanco established a goal in 2005 to restore the “fishable-swimmable” designated uses in 25 percent of the state’s impaired waters by 2012. In response to these water quality goals, the Louisiana Department of Environmental Quality (LDEQ) initiated the Clean Waters Program (CWP). An over-arching strategy of the CWP is to integrate and enhance the Department’s existing water quality protection programs at the watershed level in order to achieve Louisiana’s water quality goals.

Given that a large percentage of the state’s water quality impairments can be attributed to nonpoint sources of pollution, the nonpoint source (NPS) program will continue to be a very important component in



improving the state’s water quality. The NPS program has resulted in reduction of nonpoint source pollution and water quality improvement in some parts of the state. These improvements are expected to continue as more water bodies are targeted for watershed implementation.

Louisiana is very proud of its NPS program and what it has accomplished. The success of this program is largely attributed to the effective collaboration of federal, state, and local governments, as well as universities and non-profit organizations. It is essential to the continued progress of the program, that this effective collaboration be maintained and expanded in 2008.

Highlights of the State’s NPS Management Program for 2007 include:



- USDA and LDAF submitted a new proposal to Washington D.C. for a Conservation Reserve Enhancement Program (CREP) in southwestern Louisiana, which would result in 28,000 acres of agricultural land restored to native prairie grasses;
- LDEQ worked with East Baton Rouge Parish Planning Commission on passage of revision to their Unified Development Code that will require implementation of urban best management practices for all new and significant redevelopment residential and commercial developments;
- LDEQ completed Sand and Gravel BMP Manual that will be available for the industry and the public in early 2008;
- LDEQ continued implementing more than 40 projects within the state to reduce the amount of nonpoint source pollution entering the state’s water bodies;
- LDEQ continued working on watershed implementation plans for impaired water bodies within the Barataria and Terrebonne Basins;
- LDEQ continued to work through their GIS Center on detailed satellite imagery classification of land-uses for the Red River Basin and gathered the field data for the Lake Pontchartrain Basin. These data will be utilized for

# Preface



watershed implementation plans for impaired water bodies;

- LDAF continued to implement targeted BMP agricultural programs in priority watersheds where TMDLs and watershed plans have been completed;
- LDEQ secured funding for Louisiana's Clean Waters Program through Section 319 of the Clean Water Act;
- LDEQ submitted the revised NPS Management Plan to EPA for their review and comment.

For 2008, LDEQ looks forward to continuing NPS program efforts in accordance with established long-term program goals through identifying and initiating projects aimed at producing measurable water quality improvement.

Also this year, LDEQ will be working to further engage our NPS program partners in watershed planning and implementation as an integral element for

the overall efforts to achieve the state's water quality improvement goals. NPS projects may be woven into other LDEQ program efforts such as water quality permits, surveillance, enforcement, planning, and public outreach in order to systematically implement a watershed approach to improve water quality in Louisiana.





# Table of Contents

<i>Preface.....</i>	<i>i</i>
<i>Table of Contents .....</i>	<i>iii</i>
<i>Acronyms and Abbreviations.....</i>	<i>iv</i>
<i>Executive Summary .....</i>	<i>1</i>
<i>NPS Program Funds.....</i>	<i>2</i>
<i>Meeting the NPS Milestones.....</i>	<i>5</i>
<i>Ambient Monitoring Schedule .....</i>	<i>7</i>
<i>Implementation and Improvement.....</i>	<i>8</i>
Atchafalaya Basin.....	11
Barataria Basin .....	14
Calcasieu Basin .....	19
Mermentau River Basin .....	24
Mississippi River Basin .....	29
Ouachita River Basin.....	34
Pearl River Basin .....	42
Pontchartrain Basin.....	46
Red River Basin .....	53
Sabine River Basin.....	60
Terrebonne Basin .....	62
Vermilion-Teche River Basin .....	66
Coastal .....	72
Statewide .....	79
<i>Source Water Protection Program .....</i>	<i>84</i>
Examples of NPS Issues Addressed in 2007 by the SWP Program.....	85
Protection Activities in Targeted Parishes .....	90
<i>Appendix A List of projects by Basin that were active during 2007. ....</i>	<i>93</i>
<i>Appendix B Project Summaries.....</i>	<i>96</i>

# *Acronyms and Abbreviations*

<b>BMP</b>	.....	Best Management Practice
<b>BTNEP</b>	.....	Barataria Terrebonne National Estuary Program
<b>CNPCP</b>	.....	Coastal Nonpoint Pollution Control Program
<b>CREP</b>	.....	Conservation Reserve Enhancement Program
<b>CRP</b>	.....	Conservation Reserve Program
<b>CSP</b>	.....	Conservation Security Program
<b>CWA</b>	.....	Clean Water Act
<b>DO</b>	.....	Dissolved Oxygen
<b>EPA</b>	.....	Environmental Protection Agency
<b>EQIP</b>	.....	Environmental Quality Incentive Program
<b>ERC</b>	.....	Environmental Regulatory Code
<b>FBMP</b>	.....	Forestry Best Management Practice
<b>FY</b>	.....	Fiscal Year
<b>GIS</b>	.....	Geographic Information System
<b>GOMA</b>	.....	Gulf of Mexico Alliance
<b>GOMP</b>	.....	Gulf of Mexico Program
<b>GRP</b>	.....	Grasslands Reserve Program
<b>IR</b>	.....	Integrated Report
<b>LDAF</b>	.....	Louisiana Department of Agriculture and Forestry
<b>LDEQ</b>	.....	Louisiana Department of Environmental Quality
<b>LDHH</b>	.....	Louisiana Department of Health and Hospitals
<b>LDNR</b>	.....	Louisiana Department of Natural Resources
<b>LMRCC</b>	.....	Lower Mississippi River Conservation Committee
<b>MOU</b>	.....	Memorandum of Understanding
<b>MUS</b>	.....	Marsh Upwelling System
<b>NPS</b>	.....	Nonpoint Source
<b>SWCD</b>	.....	Soil and Water Conservation District
<b>TMDL</b>	.....	Total Maximum Daily Load
<b>USDA</b>	.....	U.S. Department of Agriculture
<b>WHIP</b>	.....	Wildlife Habitat Incentive Program
<b>WRP</b>	.....	Wetlands Reserve Program





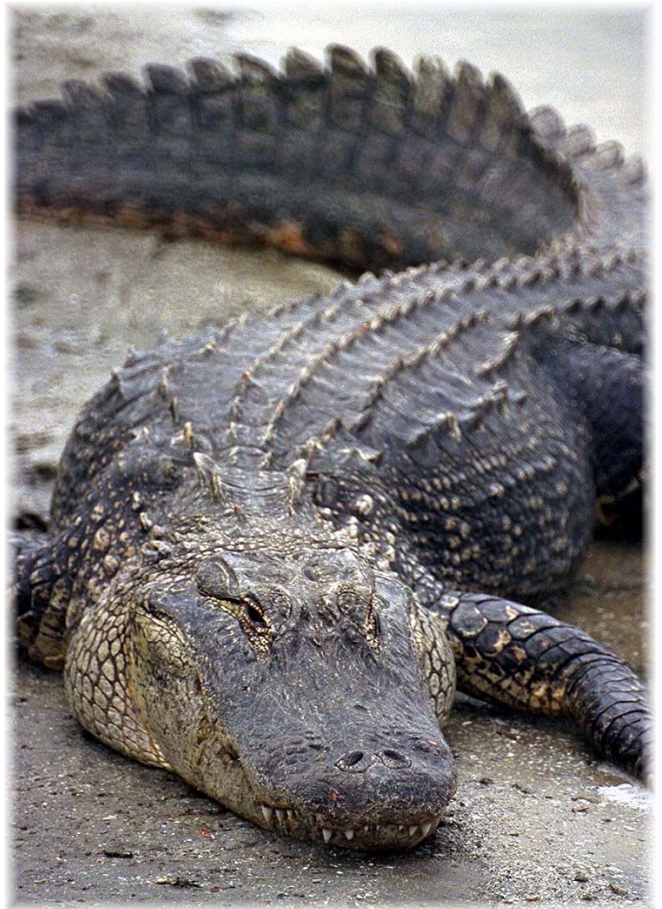
# *Executive Summary*

The Louisiana Department of Environmental Quality (LDEQ) is the state's lead agency for the Nonpoint Source Management Program. This means that they are responsible for planning, managing and coordinating nonpoint source related activities. Nonpoint source (NPS) pollution is the largest remaining water quality problem that needs to be solved in order to restore the state and the nation's impaired waters. Nonpoint sources of pollution typically do not enter the water body through a discharge pipe, but flow freely across exposed surfaces, transporting sediments from construction sites, agricultural fields and harvested forests. The State of Louisiana has identified agriculture, forestry, urban runoff, home sewage systems, sand and gravel mining operations, construction activities and hydromodification as the types of nonpoint sources of water pollution that need to be managed, if the goals of the Clean Water Act are to be met. These goals are to restore the recreational uses (i.e. contact recreation and fish and wildlife propagation) to all impaired waters.

Highlights from Louisiana's Nonpoint Source Management Program during 2007 include:

- Drafted six watershed plans for impaired water bodies which have had total maximum daily loads (TMDLs) completed for them within the Terrebonne Basin;
- Finalized six watershed plans for impaired water bodies within the Barataria Basin;
- Completed all of the work and closed the FY 2000 and 2002 Section 319 Grants;
- Finalized the BMP manual for the sand and gravel mining operations, providing it for public comment and printing;
- Tracked and managed the spending of over \$3.9 million of Section 319 grant funds;

LDEQ has continued to work with federal, state and local governments and non-profit organizations on 46 projects that address nonpoint source pollution throughout the state. All of these entities are working together to improve the quality of water in Louisiana and help reach the Governor's goal of restoring the "fishable-swimmable" uses in 25% of the state's impaired waters by 2012.



# NPS Program Funds

Section 319(h) of the Clean Water Act (CWA) established an annual grant that Congress allocates to the states, through EPA, to be used for nonpoint source-related activities that support the goals of the Act. Louisiana's allocated funds are split between LDEQ and the Louisiana Department of Agriculture and Forestry (LDAF). The incremental funds which are received by LDAF are strictly used for the implementation of agriculture and forestry BMPs in watersheds for which watershed plans and TMDLs have been completed.

The base funds which are awarded to LDEQ are available for a wider range of activities, including watershed planning and working with cities, parishes and local organizations on watershed implementation. LDEQ's portion of the grant is used to fund specific nonpoint source projects that are designed for reduction of NPS pollution, evaluation of the effectiveness of projects to improve water quality and educational projects designed to increase public awareness about nonpoint source pollution and the actions that can be taken to reduce and control it. In addition to the specific projects, Section 319 funds are also utilized to pay salaries of the staff that work on nonpoint source related activities.

The Louisiana Department of Environmental Quality expended over \$3.9 million of Section 319 funds during calendar year 2007 (Table 1) to implement 46 projects directed at reducing nonpoint source pollution and improving water quality. Of these funding expenditures, \$2,876,547 were federal funds and \$1,031,438 were provided as matching funds. For grant years 2000 and 2001, LDEQ was responsible for both the base and incremental funds. Beginning with the 2002 grant, incremental funds were awarded directly to the Louisiana Department of Agriculture and Forestry while LDEQ continues to manage the base funds.

Table 1. LDEQ Section 319 Funds Expended in 2007			
Grant Year	Federal	Match	Total
2000	977,374	308,217	1,285,591
2001	1,085,677	555,959	1,641,636
2002	733,331	12,193	745,524
2003	(251,104)	(142,305)	(393,409)
2004	54,594	46,842	101,436
2005	276,675	250,532	527,207
<b>Total</b>	<b>2,876,547</b>	<b>1,031,438</b>	<b>3,907,985</b>



# NPS Program Funds

A total of 46 projects were implemented by the LDEQ NPS Program in 2007 (Figure 1). The largest percentage of projects was implemented statewide. The Mermentau and Vermilion Basins, Barataria and Terrebonne Basins, and Red and Sabine Basins were combined because some of the projects covered both of these basins. .

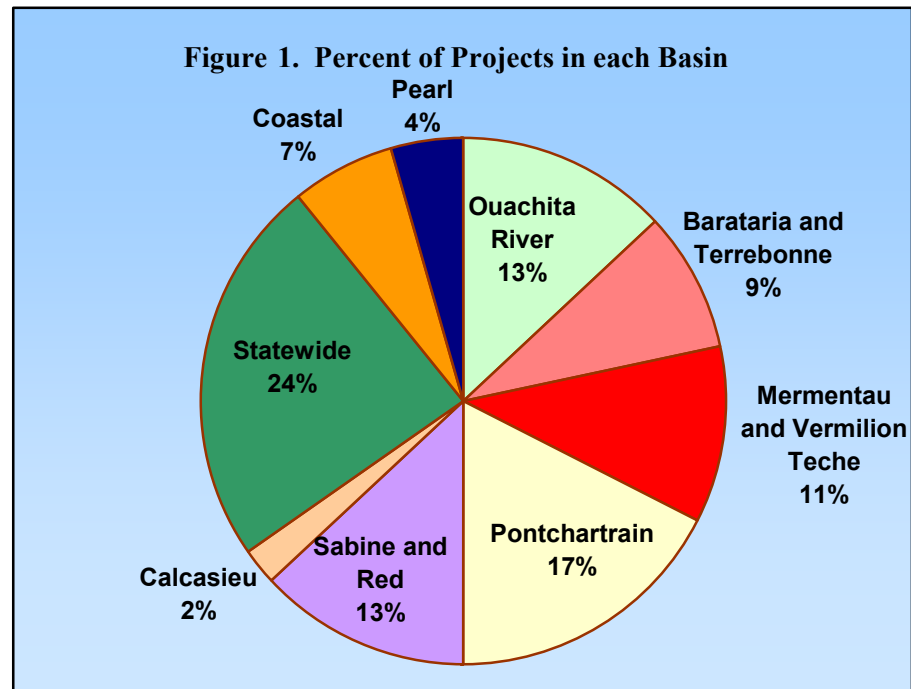


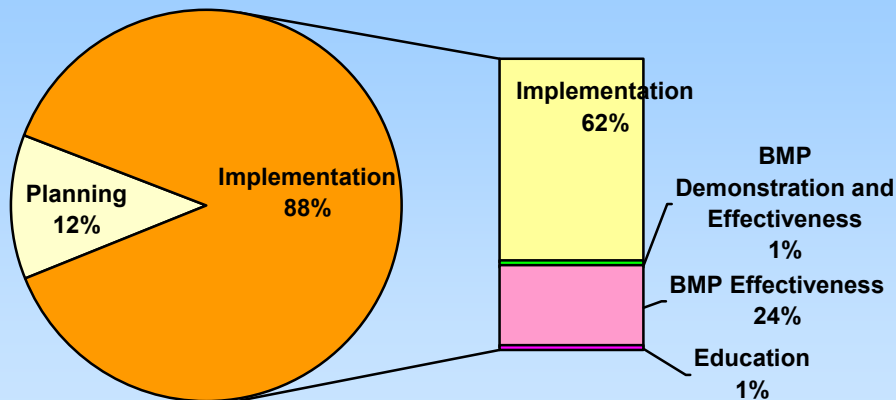
Table 2 shows how the federal and match funds were distributed among the basins. Since there were more statewide projects than projects in any one basin, there was also the largest percentage of funds spent on statewide projects.

Table 2. Total Funds Spent per Basin	
Basin	Total Funds Spent
Barataria	\$130,498
Barataria and Terrebonne	\$14,875
Calcasieu	\$0
Pontchartrain	\$654,829
Mermentau	\$185,320
Mermentau and Vermilion-Teche	\$228,733
Pearl River	\$29,987
Ouachita River	\$616,347
Red River	\$640,557
Sabine River	\$0
Sabine and Red	\$20,000
Vermilion-Teche	\$57,707
Coastal	\$14,876
Statewide*	\$1,314,256
*includes salaries, travel, supplies, operating costs, etc.	

# NPS Program Funds

Figure 2 shows how the Federal and Match funds were distributed among the five categories of projects. There are two main categories, Planning and Implementation. The categories of Education, Implementation, BMP Effectiveness, and BMP Demonstration and Effectiveness all fall under the main category of Implementation.

**Figure 2. Percent of Total Funds Spent per Project Category**





# *Meeting the NPS Milestones*

The Louisiana Department of Environmental Quality (LDEQ) outlined a 15-year timeline within the 2000 NPS Management Plan to implement a watershed strategy for the state. This timeline was expanded to meet the court ordered schedule to develop TMDLs for all impaired water bodies by 2011. Within that timeline, LDEQ anticipated that it would take three cycles of water quality data collection over 15 years to see major water quality improvements as a result of watershed implementation. The NPS Management Plan has two main goals to accomplish by the year 2012: to restore the designated uses in 25% of the impaired water bodies and to remove water bodies from the 303(d) list of impaired waters.

Data was collected in the Mermentau and the Vermilion-Teche River Basins during 1998, the Calcasieu and Ouachita River Basins in 1999, the Barataria and Terrebonne Basins in 2000, Pontchartrain and Pearl Basins in 2001, and the Red and Sabine Basins in 2002. The cycle began again in 2003 for many of the water bodies in the Mermentau and Vermilion Basins and continued into 2004 for the Mermentau, Vermilion, Ouachita and the Barataria Basins. Therefore, much of the data presented represents the first 5-year cycle of that 15-year timeline.

During 2007, the state has adhered to this timeline. LDEQ has implemented projects and programs to reduce nonpoint source pollutants in the Mermentau, Vermilion-Teche, Calcasieu, and Ouachita River Basins as the timeline indicates, as well as in every other basin in the state. Specific details of these projects are provided within the respective sections of this report. Six Watershed Plans were finalized for the Barataria River Basin in 2007, and six draft Watershed Plans were developed for the Terrebonne Basin. TMDLs were developed for impaired watersheds in the Terrebonne, Red and the Sabine Basins. In 2007, water quality surveys were conducted on seven water bodies in the Pontchartrain Basin. The water bodies were Bayou Manchac (040201), Amite River (040303), Grays Creek (040304), Colyell Creek System (040305) Blind River – Amite River Diversion Canal (040401), Blind River (040403), and New River (040404). Two surveys were conducted on the Colyell Creek System. The first survey was at high flow and the second was after an oil spill; therefore, LDEQ will conduct another survey on this water body in 2008.



# Meeting the NPS Milestones

Table 3. Schedule of Milestones for Louisiana's NPS Management Program

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Mermentau																			
Vermilion																			
Calcasieu																			
Ouachita																			
Barataria																			
Terrebonne																			
Pontchartrain																			
Pearl																			
Red																			
Sabine																			
Mississippi																			
Atchafalaya																			

- 1- Black Stripes = Collect Water Quality Data to Develop Total Maximum Daily Loads (TMDLs) and to Track Water Quality Improvement at the Watershed Level
- 2- Light Grey = Develop Total Maximum Daily Loads for the Watersheds on the 303(d) List
- 3- Green = Develop Watershed Management Plans to Implement the NPS Component of the TMDL
- 4- Yellow = Implement the Watershed Management Plans
- 5- Blue = Develop and Implement Additional Corrective Actions Necessary to Restore the Designated Uses to the Water Bodies



# Ambient Monitoring Schedule

LDEQ revised its monitoring program in May of 1998 to operate on a five-year cycle with monthly sample collections occurring in two or three basins each year and rotating from year to year (calendar year). In this manner, the entire state had been covered at the end of 2002. Although the five-year cycle completed the goal of collecting water quality data from every sub-segment in the state, it did not correspond with the even year §305(b) reporting cycle and placed a disproportionate amount of responsibility on the regional field staff during the one-year surveys. Additionally, LDEQ prefers to use two cycles of monitoring data for a more accurate assessment. When two cycles of data are used, the five-year rotating cycle causes large time gaps in the datasets used for some water bodies in each assessment cycle. In an effort to equalize the number of basins assessed every two years, balance the field staff work load, and minimize data gaps, LDEQ implemented a four-year rotating sampling plan in January, 2004 (Table 7).

Within each basin, all monitored sub-segments will be sampled over the year or years specified under each cycle period. Water quality assessments for the Integrated Report will be conducted for each basin following the last year of its monitoring period. Approximately 125 water body sub-segments are typically monitored each month under this program.

Table 4. Ambient Monitoring Schedule		
Basin	First 4-Year Cycle	Second 4-Year Cycle
Mermentau	2004, 2005, 2006, 2007	2008, 2009, 2010, 2011
Vermilion-Teche	2004, 2005, 2006, 2007	2008, 2009, 2010, 2011
Calcasieu River	2004, 2005	2008, 2009
Ouachita River	2004, 2005	2008, 2009
Barataria	2004, 2005	2008, 2009
Terrebonne	2004, 2005	2008, 2009
Mississippi River	2004, 2005	2008, 2009
Pontchartrain	2006, 2007	2010, 2011
Pearl River	2006, 2007	2010, 2011
Red River	2004, 2005, 2006, 2007	2008, 2009, 2010, 2011
Sabine River	2006, 2007	2010, 2011
Atchafalaya River	2004, 2005	2008, 2009

Assessment procedures follow U.S. EPA guidance documents for §305(b) assessments, U.S. EPA's Consolidated Assessment and Listing Methodology (CALM) guidance (U.S. EPA, 2002), U.S. EPA's Integrated Report guidance (found within CALM guidance), as well as Louisiana's surface water quality standards, and ERC 33:IX.1101-1123.



# *Implementation and Improvement*

One of the strengths of Louisiana's NPS Program is the watershed planning and implementation strategy. This strategy utilizes TMDLs combined with detailed land-use classification from satellite imagery and watershed modeling. During 2007, six Watershed Plans were finalized for the Barataria Basin, and the field work for satellite imagery classification was completed for the Pontchartrain Basin. The incremental component of the Section 319 grant is utilized for implementing BMPs in these watersheds where TMDLs and watershed plans have been completed. These watershed plans are the basis for implementing nonpoint source projects by both LDEQ and the Louisiana Department of Agriculture and Forestry's (LDAF's) Office of Soil and Water Conservation.

All of the completed TMDLs can be viewed on LDEQ's website at:

<http://www.deq.louisiana.gov/portal/default.aspx?tabid=1563>.

Watershed Implementation Plans can be viewed on the Nonpoint Source Pollution Unit website at:

<http://nonpoint.deq.louisiana.gov/wqa/WaterShedPlanning.htm>. A list of all the NPS projects that were active during 2007 is located in Appendix A.



**The LDEQ Nonpoint Source Unit**

During 2006, LDEQ finalized the 2006 Integrated Report, which provides information on the level of attainment of all of the water bodies within the state, based on water quality data from 2000 to 2005. The Integrated Report is written once every two years, so the next report will be developed in 2008. These data indicated that water quality had improved (i.e., one or more causes of impairment

# Implementation and Improvement

had been removed) in 80 water bodies across the state between the 2004 and 2006 listing cycle (Table 8). In addition to these improvements, there were 254 water bodies that had one or more causes of impairment removed between the 2002 and 2004 listing cycle, due to water quality improvements. The improvements are distributed in 10 of the 12 river basins, with the Sabine and Mermentau River Basins not exhibiting improvements.

Table 5. Waterbody Improvement per Basin			
River Basin	Number of Water Bodies Improved in 2004 IR	Number of Water Bodies Improved in 2006 IR	Reason for Improvement
Atchafalaya	6	3	New data shows attainment
Barataria	27	10	New data shows attainment
Calcasieu	13	8	New data shows attainment
Pontchartrain	56	2	Data shows attainment
Vermilion-Teche	6	2	New data shows attainment
Mississippi River	11	0	New data shows attainment
Ouachita River	35	36	New data shows attainment
Red River	33	6	New data shows attainment
Pearl River	8	0	New data shows attainment
Terrebonne	59	13	New data shows attainment
<b>Total</b>	<b>254</b>	<b>80</b>	

These water quality data indicated that there has been substantial progress made in improving water quality. One example of where these improvements can be linked with nonpoint source implementation is within the Ouachita River Basin. In 2002, LDEQ completed 10 TMDLs for water bodies that were included on the State's 303(d) list of impaired waters. During 2002, EPA completed more than 20 individual TMDLs and a TMDL that covered groups of water bodies that were impaired within the Ouachita River Basin. Therefore, more than 30 TMDLs were completed for impaired water bodies within the Ouachita River Basin.

Nonpoint sources of pollution were identified as a major contributor to these water quality problems, including sediments, nutrients, dissolved oxygen and turbidity, primarily from watersheds that are predominantly agricultural (row crops, pastures or poultry operations). During 2005, watershed plans were developed for 13 watersheds within the Ouachita River Basin, incorporating TMDLs that both LDEQ and EPA had done for the various water quality impairments that existed in these water bodies. Prior to 2005, there had already been extensive implementation of agricultural BMPs through both USDA Farm Bill Programs and Section 319 projects administered by both LDEQ and LDAF.

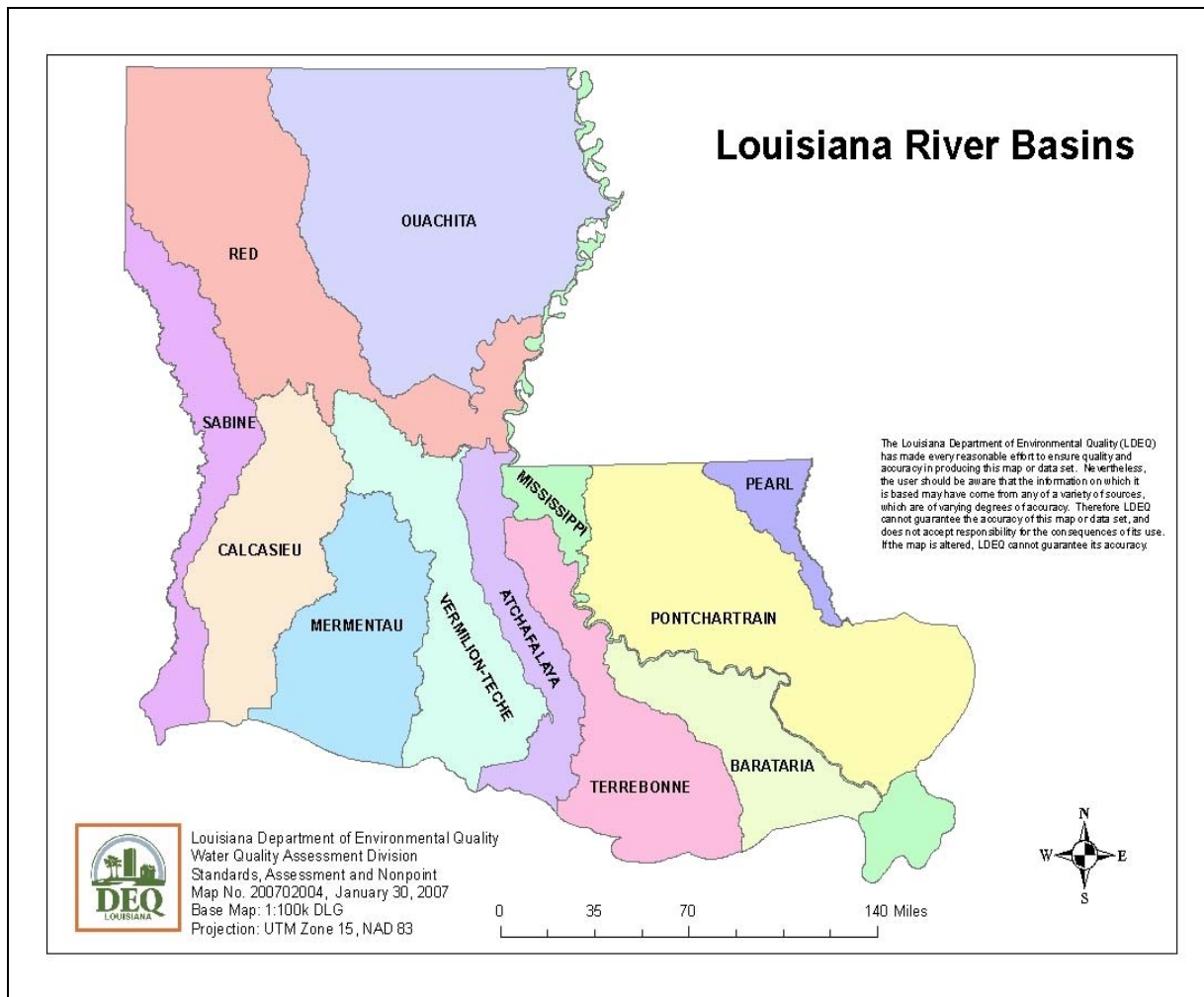
During 2005, the CREP was implemented in watersheds of the eastern portion of the Ouachita River Basin, which has resulted in 47,992 acres of highly erodible lands being taken out of production and planted to permanent pastures and trees or restored to bottomland hardwood forests. During 2006, an estimated 108,888 acres of BMPs were implemented within the Ouachita River Basin through the USDA. During 2007, the USDA implemented a total of approximately 102,125 acres of BMPs. All of these programs collectively have resulted in less sediment and nutrients entering the water body, with the water quality responding positively to these changes.



# Implementation and Improvement

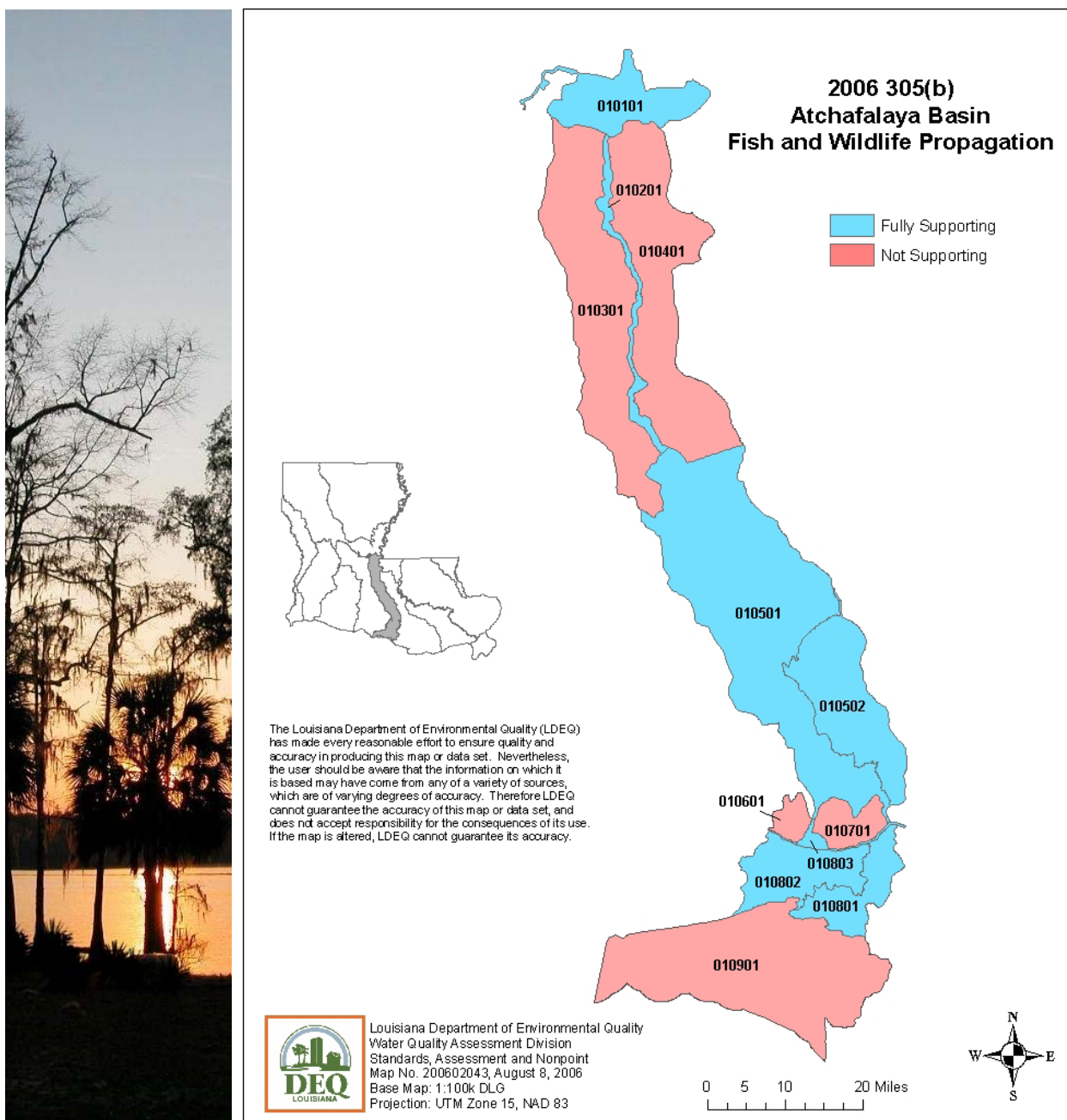
There is a wider variation in fecal coliform concentrations from year to year, with drought years producing lower numbers and rainy years producing higher numbers. However, as more practices are implemented at the watershed level, the nonpoint source pollutant load should decrease and the water bodies should eventually respond, so that in-stream water quality improvements can be detected and measured.

These tables include annual averages for dissolved oxygen and fecal coliform bacteria from selected water bodies within each of the basins in which nonpoint source projects have been or are in the process of being implemented. It is important to note that 1998-2000 and 2005 were drought years in Louisiana, which affects the loading rates of pollutants and the low flow conditions of the water bodies. The data does indicate that there is some stability in the water bodies from year to year, with only small fluctuations in dissolved oxygen conditions. However, low dissolved oxygen may be partially caused by drought conditions. A lack of rainfall could lead to lower stream flow, lower water levels, and higher water temperatures, which result in lower dissolved oxygen.



# Implementation and Improvement

## Atchafalaya Basin



Located in south central Louisiana, the Atchafalaya River Basin is the nation's largest forested swamp, containing over half a million acres of hardwood bottomlands, bayous, and swamps. The Atchafalaya River Basin consists of twelve sub-segments, all of which are in full compliance with the contact recreational uses. There are no exceedances of the water quality standard for fecal coliform within the Atchafalaya Basin. The 2006 Integrated Report indicated that half of the water quality subsegments were not fully meeting the fish and wildlife propagation use. Most of the water quality impairments were caused by either mercury or dissolved oxygen.

# Implementation and Improvement

TMDLs are scheduled to be completed for these impaired water bodies by 2009. The East Atchafalaya Basin, Morganza Floodway south to I-10 Canal, Crow Bayou, and Bayou Blue and its tributaries will be scheduled for TMDLs for dissolved oxygen, chloride, sulfates and total dissolved solids from irrigated and non-irrigated crop production, home sewage systems and natural sources. During 2007, USDA has worked with the landowners and farmers on best management practices (BMPs).

## USDA Programs\*

During 2007, the USDA implemented approximately 10,062 acres of BMPs within the Atchafalaya Basin through the Environmental Quality Incentive Program (EQIP). An additional 600 acres of practices were implemented through the Conservation Reserve Program (CRP), 28 acres of practices were implemented through the Conservation Security Program (CSP), 751 acres of practices were implemented through the Wetlands Reserve Program (WRP), 18 acres of practices were implemented through the Grasslands Reserve Program (GRP), and 49 acres of practices were implemented through the Wildlife Habitat Incentives Program (WHIP).

\*All USDA information was taken from the 2007 PRS Report.

The Louisiana Department of Natural Resources (LDNR) coordinates the Atchafalaya Basin Program which is involved in a watershed project for Iberville, Pointe Coupee and West Baton Rouge Parishes. This is a watershed program that involves all of the stakeholders in outlining the problems and identifying the solutions that can be implemented to solve water quality and habitat issues that exist within this part of the Atchafalaya Basin. More information about the Atchafalaya Basin Program can be found at their website: <http://dnr.louisiana.gov/sec/atchafalaya/>

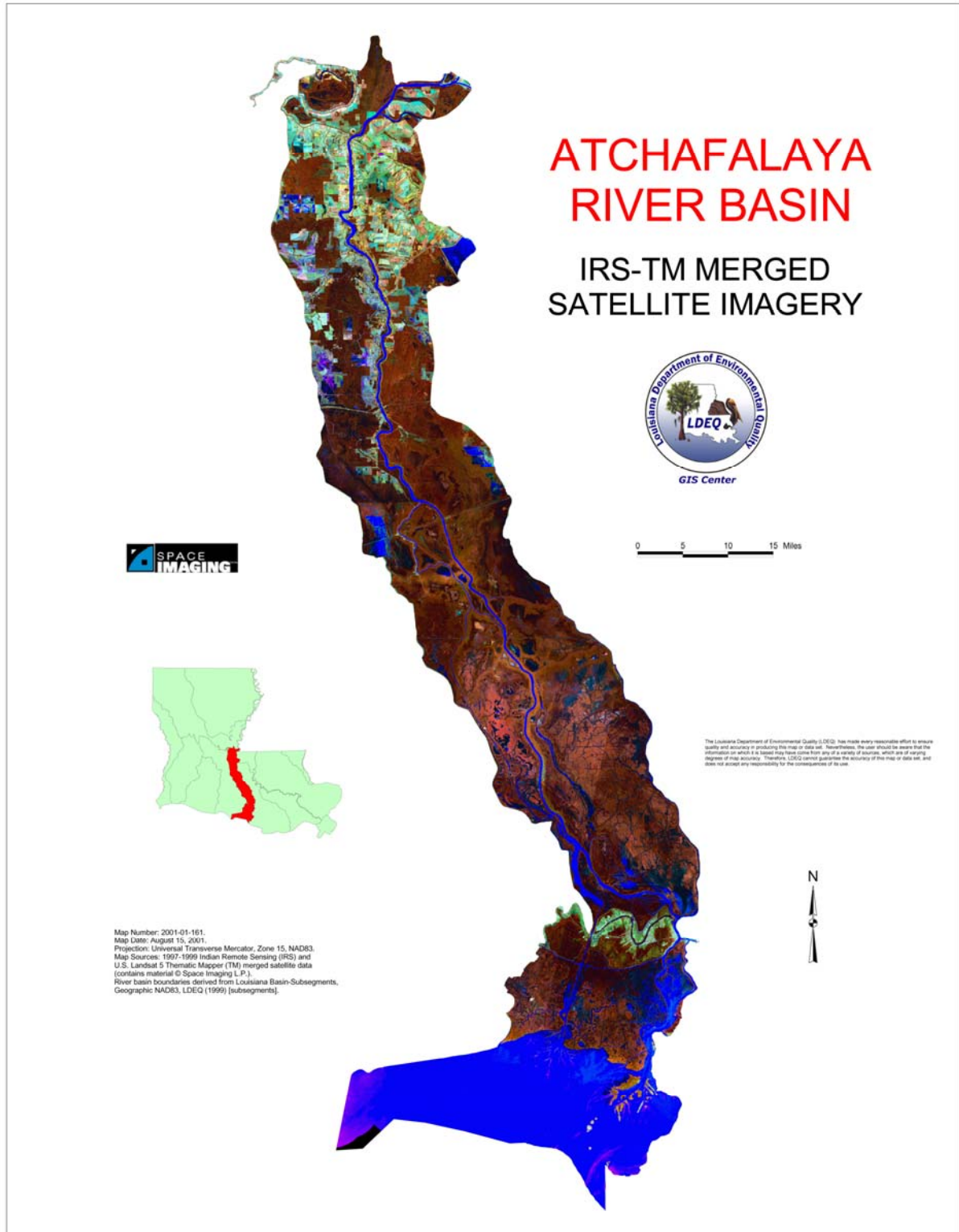
Average Dissolved Oxygen Concentrations Measured in mg/L for Selected Water Bodies in the Atchafalaya Basin				
Water Body (subsegment)	2002	2004	2005	2006
Atchafalaya River (010101)	no data	no data	7.54	8.34
Wax Lake Outlet (010802)	7.72	7.50	no data	no data

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for Selected Water Bodies in the Atchafalaya Basin			
Water Body (subsegment)	2002	2004	2006
Atchafalaya River (010101)	139	no data	162
Wax Lake Outlet (010802)	62	43	no data

These data for the Atchafalaya River indicate that both the dissolved oxygen and fecal coliform concentration are meeting water quality standards and that the river is fully supporting its designated uses. The satellite image illustrates that much of the basin is forested wetlands with agricultural cropland in the headwaters of the basin.

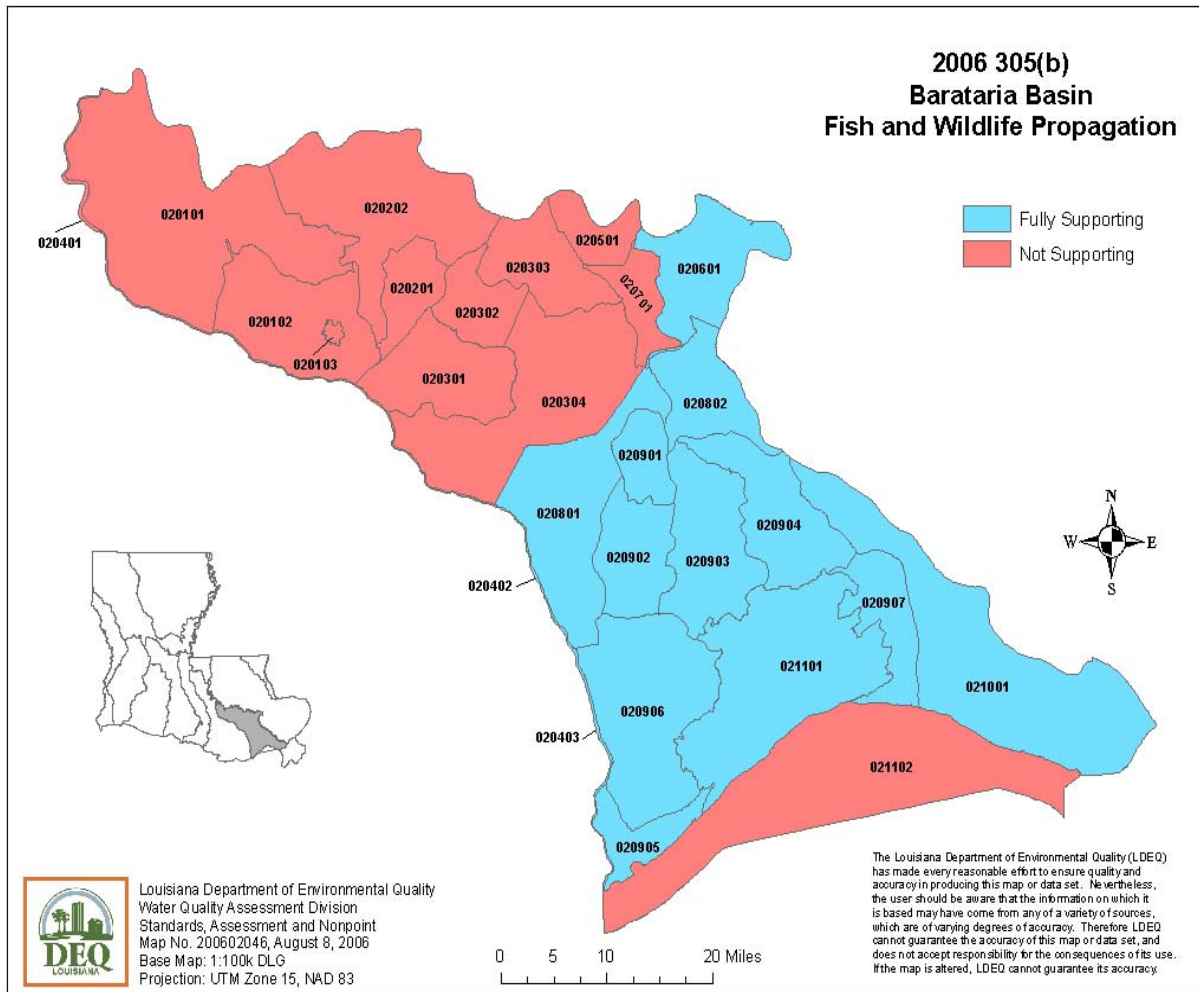


# Implementation and Improvement



# Implementation and Improvement

## Barataria Basin



The Barataria Basin lies in the eastern coastal region of the state and is bounded on the north and east by the Lower Mississippi River and on the west by Bayou Lafourche. The Barataria drains to the Gulf of Mexico with the major receiving water body being Barataria Bay. The land-use within Barataria Basin ranges from sugarcane and forests in the north to forested wetlands, and freshwater and saltwater marshes to the south.

During 2000, 2004 and 2005, water quality surveys were conducted for each of the impaired water bodies. TMDLs were developed in 2004 for these five watersheds: Bayou Boeuf/Halpin Canal, Bayou Verret/Bayou Chevreuil/Bayou Citamon, Bayou des Allemands, Bayou Segnette and St. Charles Canal and bayous. Detailed satellite imagery was classified for the entire Barataria Basin. Staff within the NPS Unit completed six watershed plans in 2007 for this Basin. Water quality data will be collected again during 2008 to determine whether the watershed projects that have been implemented have resulted in reductions of nonpoint source pollutants and improvements in water quality.

# Implementation and Improvement

The 2006 Integrated Report indicated that 11 water bodies were fully meeting the contact recreational uses but were not meeting the fish and wildlife propagation use. As the map illustrates, the majority of the water quality problems exist within the upper portion of the Barataria Basin. This information indicates how difficult it is for the dissolved oxygen standard to be met within both the agriculture and forested watersheds. The agricultural lands drain to the low lying areas, delivering sediments, nutrients, and organic material to the bayous. The bayous have been channelized for agricultural drainage, oil and gas production, and navigation. The slope of the water body is so slight that the flows are very low or non-existent during the summer months, making it difficult for the water bodies to re-oxygenate themselves.

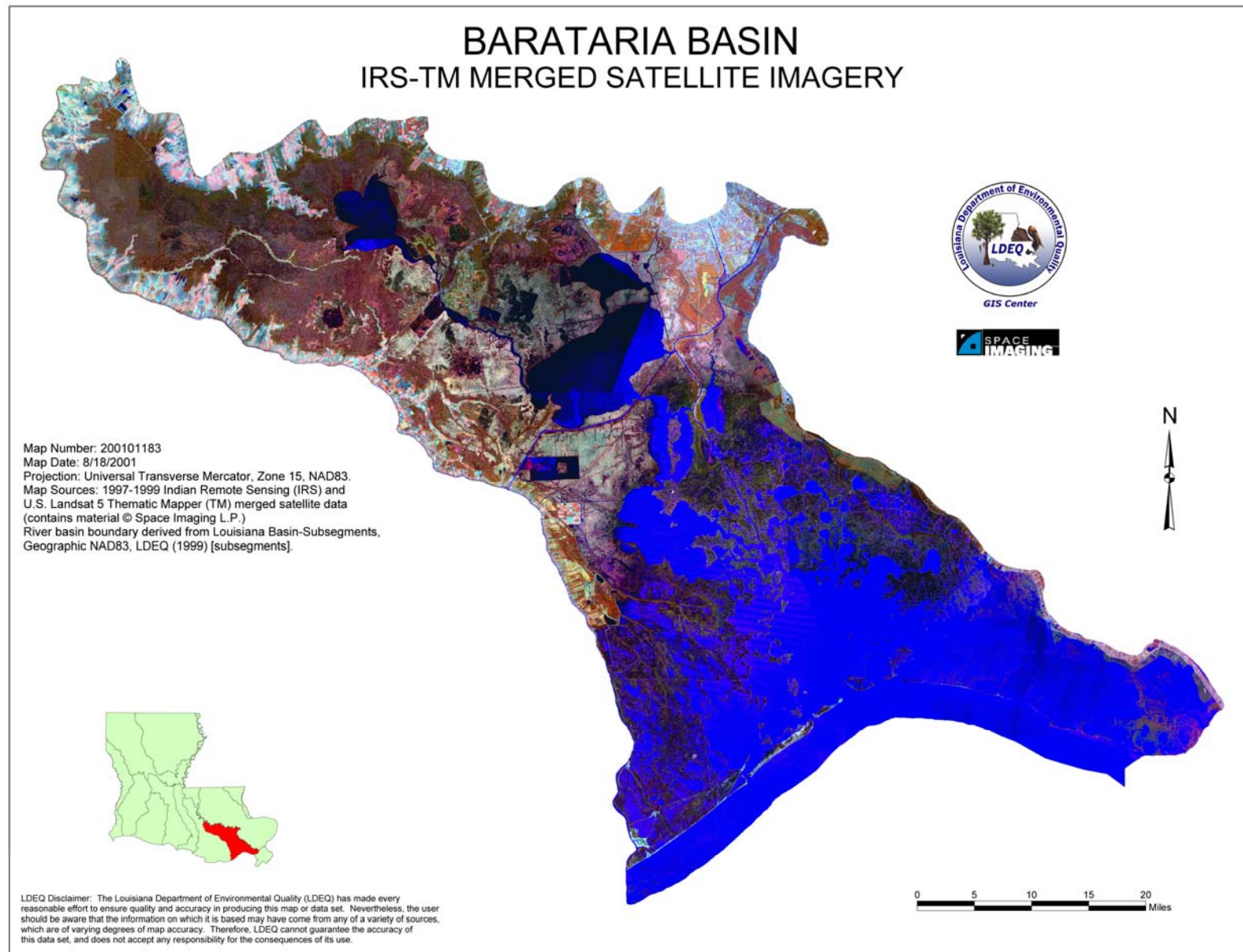
Average Dissolved Oxygen Concentrations Measured in mg/L for Selected Water Bodies in the Barataria Basin					
Water Body (subsegment)	2000	2004	2005	2006	2007*
Bayou Boeuf, Halpin Canal, Theriot Canal (020102)	3.79	3.52	no data	no data	no data
Bayou Verret, Bayou Chevreuil, Bayou Citamon, Grand Bayou (020101)	3.34	2.49	no data	3.04	no data
Bayou des Allemands (020301)	4.31	no data	6.69	no data	5.46
Bayou Lafourche (020401)	5.70	6.94	6.66	6.71	6.28
*partial year data in 2007					

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for Selected Water Bodies in the Barataria Basin					
Water Body (subsegment)	2000	2004	2005	2006	2007*
Bayou Boeuf, Halpin Canal, Theriot Canal (020102)	203	69	no data	no data	no data
Bayou Verret, Bayou Chevreuil, Bayou Citamon, Grand Bayou (020101)	317	185	no data	93	no data
Bayou des Allemands (020301)	114	no data	53	no data	158
Bayou Lafourche (020401)	127	357	323	265	963
*partial year data in 2007					





# Implementation and Improvement



# *Implementation and Improvement*

## **Water Quality of Upper Barataria Basin: Impact of NPS Pollution Associated with Sugarcane Production**

This project was completed and the Final Report was approved in 2007. The overall goal of this project was to quantify nonpoint source pollutant loads in the upper Barataria Basin associated with sugarcane fields and natural forested wetlands. These data can be incorporated into watershed plans, which will guide efforts to improve water quality within this part of the State.



The project represented two years of runoff sampling. Two sugarcane field sites were instrumented with automated water sampling equipment for collecting runoff data. The two fields were representative of sugarcane production practice for the area. At each sugarcane field, an ISCO automated water sampler powered by a solar panel and battery was installed at an edge-of-field culvert appropriate for sample collection. Flow meters were used in conjunction with this installation (with an area velocity flow meter). In order to determine the impact of

sugarcane runoff on water quality in water bodies receiving runoff, grab water samples were collected from three locations during selected rainfall events.

As shown by data in this project, nutrients, suspended solids, and pesticides are entering stream and water bodies in Barataria Basin as result of runoff from sugarcane fields. During major rainfall events in which runoff from sugarcane occurs, there was a parallel spike in nutrients, and suspended solids in St. James Canal, which flows directly into other stream and water bodies.

Agricultural runoff associated with sugarcane production on the elevated natural levees of the Mississippi River is directed through a series of lateral drains that connect major drainage ditches or canals. These ditches or canals funnel runoff along an elevation gradient to connecting stream water bodies in the Barataria Basin. Runoff from sugarcane fields in St. James Parish is funneled directly through a series of drainage ditches and canals into the major natural streams within Barataria Basin. There is little or no contact with any buffer strips including wetland buffer, which would reduce the amount of suspended sediment, nutrients and pesticides, etc. from entering streams and water bodies within the watershed.

The amount and distribution of the input varied, likely dependent on rainfall, amounts and timing of application of agricultural chemicals and season. The reduction of these inputs would be a vital step in the restoration of water quality.

# Implementation and Improvement

## **Marsh Upwelling System Demonstration Project in the Bayou Segnette Watershed, Phase II**

The Marsh Upwelling System (MUS) project was completed in December 2006 and the Final Report was approved by EPA in 2007. The MUS represents a new technology in treating wastewater and is believed to be particularly effective in the saline marsh. The project is located at two sites on the Bayou Segnette Louisiana Waterway (LDEQ water quality sub-segment 020701): a single camp that is permanently occupied and a camp cluster that is occupied part-time. Wastewater from the camps is intermittently pumped three meters below the surface of the saltwater marsh by injection well. Buoyancy of the wastewater (freshwater) forces it to travel upward in the saltwater marsh. Mechanical and biological filtration of the wastewater occurs as the plume moves upward through the soil, plant roots, and organisms. Bayou Segnette is in the Barataria-Terrebonne National Estuary, from which 95% of Louisiana's shellfish are harvested, and has been on the 303(d) list of impaired water bodies for low DO and elevated coliform bacteria levels. Sources of Barataria-Terrebonne pollutants include improperly functioning or nonexistent sewage treatment systems.

The MUS operated very well at Bayou Segnette, indicating that the system operates as effectively in a less saline marsh as in a saltwater marsh. Bacteria and CBOD5 were reduced to below effluent

discharge limits prior to wastewater reaching the marsh surface. Up until Katrina, the system had been in operation for nearly three years and no signs of clogging had been observed at that point. This project, along with projects from this and other sites, suggests that the MUS has a very good capacity for treatment of the bacterial and organic matter components of wastewater. Cessation of the system showed that bacteria levels quickly diminish to near



Camp Cluster on Bayou Segnette

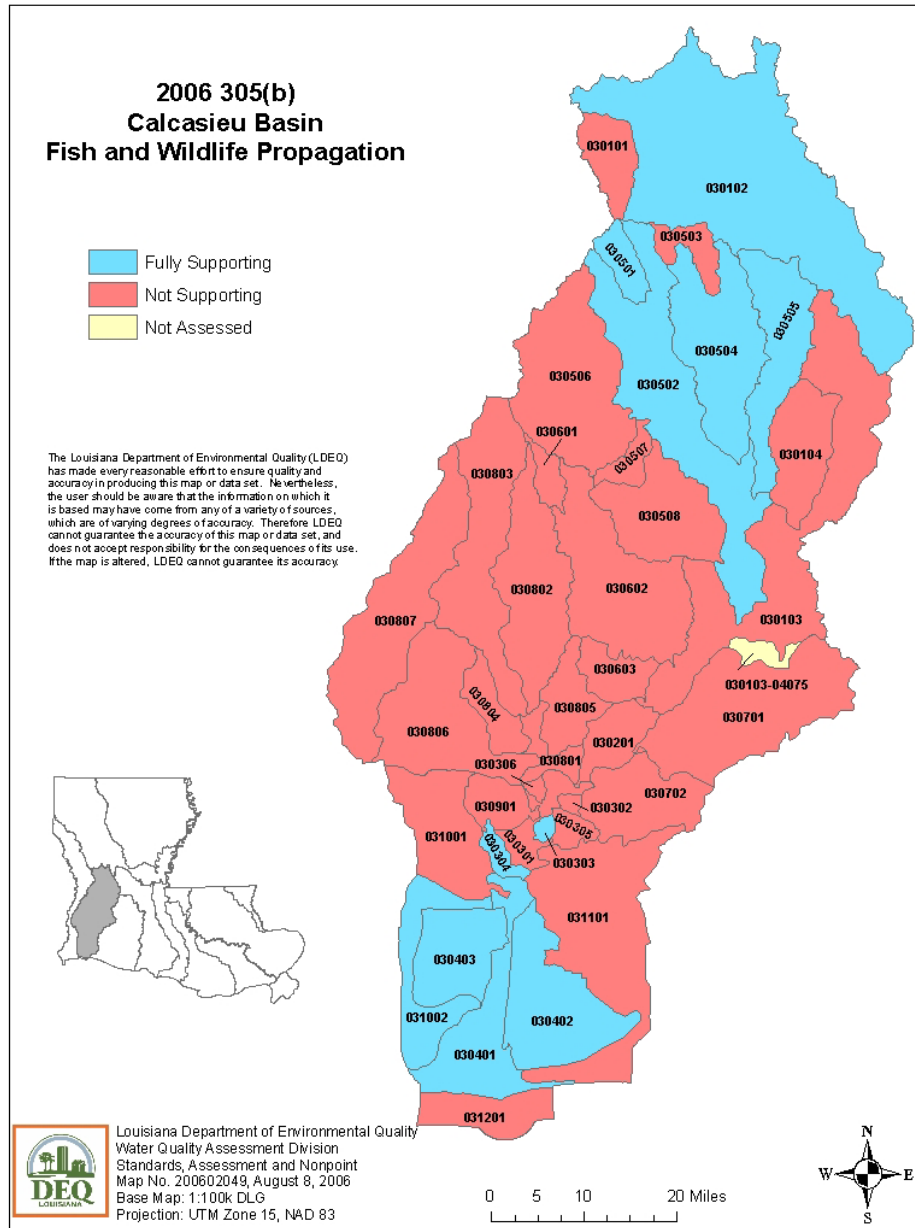
those of background conditions. Oxygen demand, in the form of CBOD5, however, had not reached background conditions a year after system shutdown; rather, CBOD5 levels appear to have reached a new steady state. Overall, the MUS shows great promise as a decentralized wastewater treatment system in marsh environments.





# Implementation and Improvement

## Calcasieu Basin



The Calcasieu River Basin lies within southwestern Louisiana and is bordered by the Sabine River Basin to the west and the Mermentau River Basin to the east. The drainage area of the Calcasieu River Basin comprises 3,910 square miles with its headwaters in the hills of western Alexandria. The river flows south for about 160 miles to the Gulf of Mexico. The land-use within this basin is varied, ranging from row crop agriculture in the east to pastures and forests in the west. The southern portion of the basin consists of brackish and salt water marshes.

# Implementation and Improvement

During 1999, water quality surveys were conducted for the impaired water bodies. During 2002 and 2003, fifteen TMDLs were developed for fourteen watersheds within the Calcasieu River Basin. Detailed satellite imagery classification was completed for six watersheds: Bayou Serpent, Marsh Bayou, Mill Creek, Indian Bayou, Little River, and Barnes Creek. The NPS Unit staff completed watershed plans for these six watersheds in 2004. These watershed plans indicate that agricultural production in the eastern part of the basin is contributing to the water quality problems.

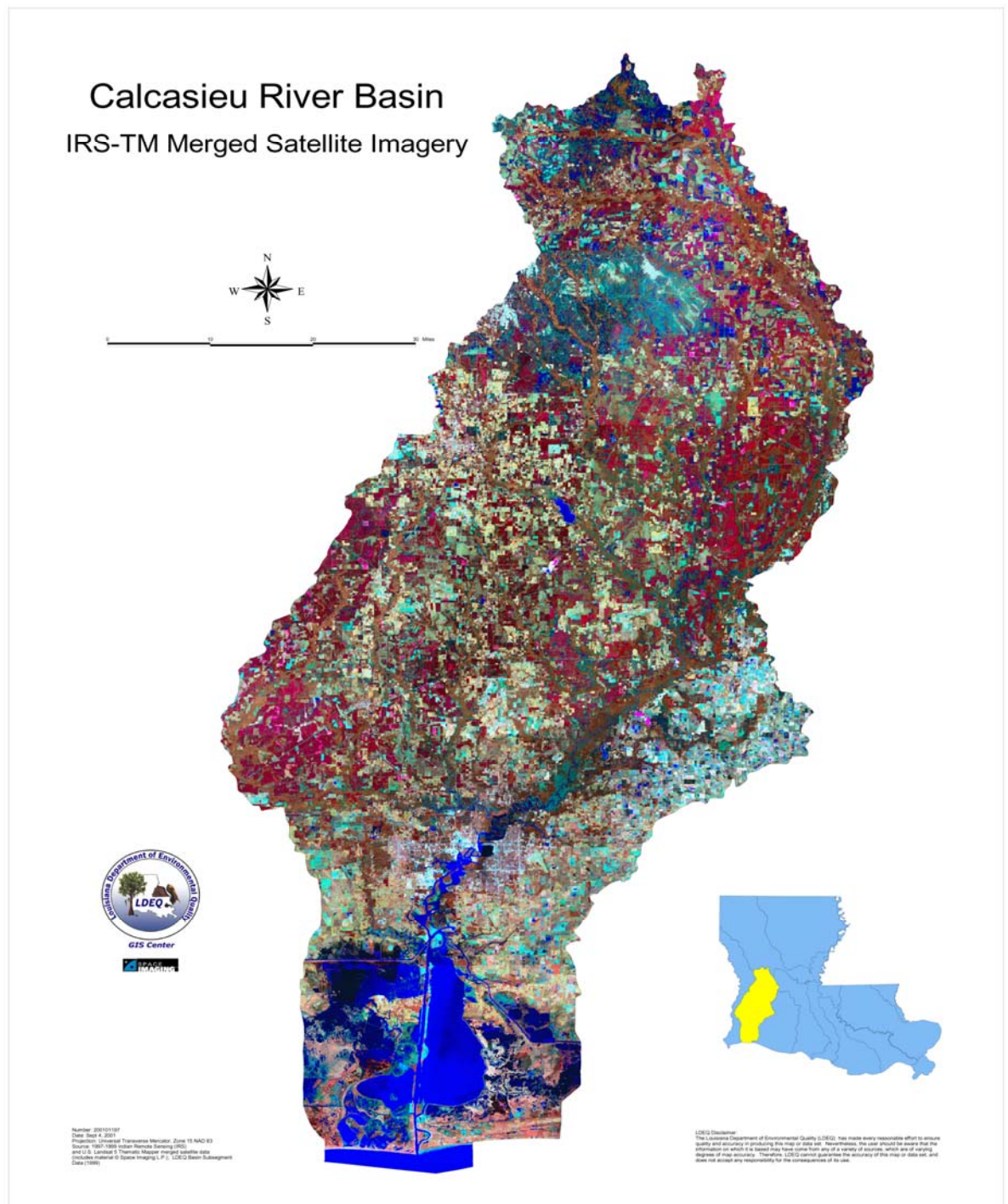
During 2004 and 2005, LDEQ continued to collect and analyze water quality data for the Calcasieu River Basin to determine if water quality had improved since 1999, which was the last cycle when data was collected. The most recent data does indicate that water quality has improved for dissolved oxygen in some water bodies, while others have declined.

Average Dissolved Oxygen Concentrations Measured in mg/L for Selected Water Bodies in the Calcasieu River Basin			
Water Body (subsegment)	1999	2004	2005
Barnes Creek (030602)	4.36	no data	3.20
Bayou Serpent (030701)	3.31	no data	2.69
Marsh Bayou (030603)	2.76	no data	1.56
Indian Bayou (030805)	2.29	4.23	no data
English Bayou (030702)	3.6	3.59	no data
Whiskey Chitto Creek (030501)	7.08	8.49	7.80

The data for fecal coliform indicated that levels are increasing for most of the water bodies in the Calcasieu River Basin.

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for Selected Water Bodies in the Calcasieu River Basin			
Water Body (subsegment)	1999	2004	2005
Barnes Creek (030602)	84	no data	2908
Bayou Serpent (030701)	77	no data	563
Marsh Bayou (030603)	370	no data	2237
Indian Bayou (030805)	223	4678	no data
English Bayou (030702)	239	1490	no data
Whiskey Chitto Creek (030501)	888	572	no data

# Implementation and Improvement



# Implementation and Improvement

## Central Calcasieu River Watershed 319 Nonpoint Source Project

The Central Calcasieu River Watershed Project was completed in July 2006, and the Final Report is currently under review. In this project, the Allen Soil and Water Conservation District provided financial and technical assistance to landowners in the Kinder area of Allen Parish. Local farmers adopted conservation practices with the District's assistance for a period of three years and agreed to have their lands available as demonstration sites. About ten landowners signed on to participate and most of the acres involved were planted with rice. Drought conditions during the project did cause some delays. However, participants did successfully adhere to BMPs. Some delays have occurred from Hurricane Rita on September 24, 2005.



Houseboat on Bayou Serpent

Throughout the project, the producers installed and completed the following management activities: Irrigation Water Management, Nutrient Management, Pest Management, Prescribed Grazing Management, and Record Keeping. In addition, producers have completed the Irrigation Land Leveling practices on their contracts. The project benefited 4,321.1 acres of land and contributed to a reduction 5,118 tons of soil erosion. In addition, Wetland Wildlife Habitat Management created a winter habitat for countless species of migratory birds and waterfowl.

The management practices and recordkeeping required for this project has helped the producers meet eligibility requirements for the USDA Environmental Quality Incentive Program. Two of the producers that remain in farming have also completed training in the Louisiana Master Farmer Program. One of these producers has completed all of the requirements and has been certified as a Louisiana Master Farmer. The second producer is currently completing the required conservation plan on his entire operation and is expected to receive certification in June 2008.

### USDA and SWCD Programs

During 2007, the USDA implemented approximately 14,036 acres of BMPs within the Calcasieu River Basin through the EQIP. An additional 268 acres of practices were implemented through the Conservation Reserve Program (CRP), 195 acres of practices were implemented through the Wetlands Reserve Program (WRP), and 1,457 acres of practices were implemented through the WHIP.

The Soil and Water Conservation District utilized Incremental 319 funds in the Calcasieu River Basin. The federal funds resulted in 5513 acres of BMPs being implemented and the matching funds resulted in 21,965 acres of BMPs implemented within the Calcasieu River Basin.

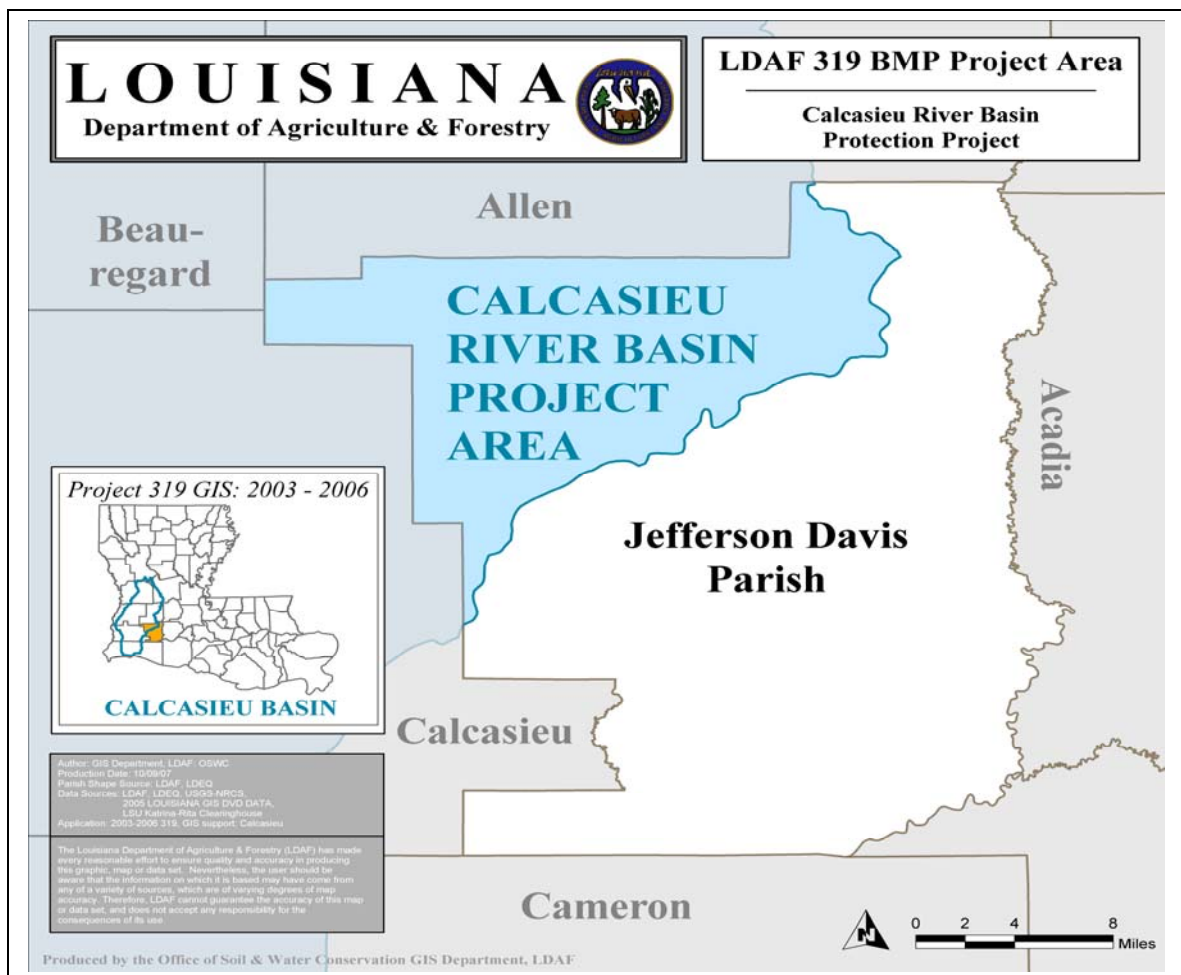
In addition to the work that USDA did on watershed implementation, the Office of Soil and Water Conservation implemented a project where agricultural BMPs were implemented. The following table summarizes the types and acres of BMPs that were implemented through this project during



# Implementation and Improvement

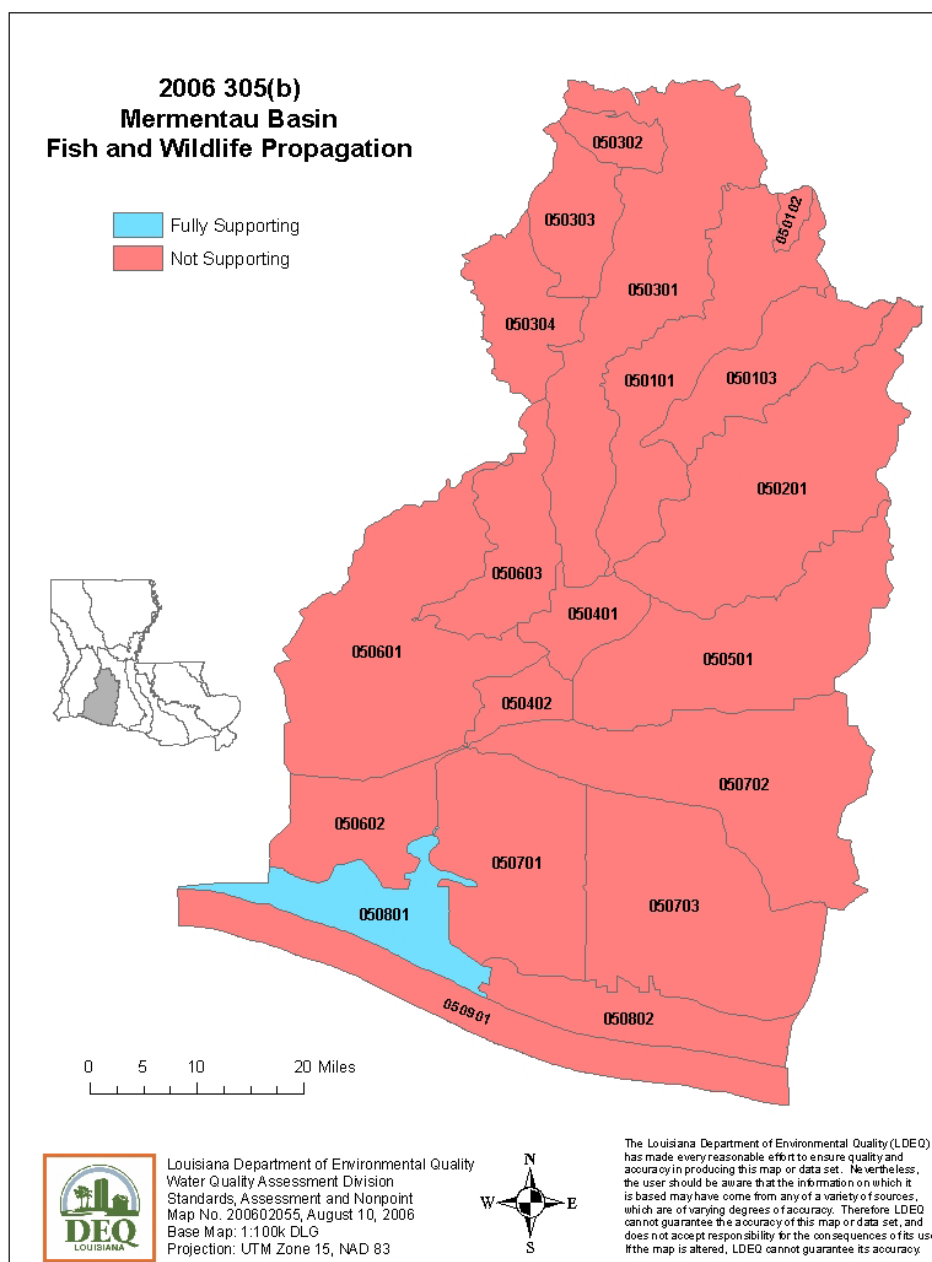
2007. The map illustrates that the project was in Jefferson Davis Parish which falls on the border of the Calcasieu and Mermentau River Basins.

	Federal	Match	Total
BMP	Ac/No.	Ac/No.	Ac/No.
328 - Conservation Crop Rotation	0	5510.4	5510.4
344 - Residue Mgmt Seasonal	1711.3	1108.4	2819.7
410 - Grade Stab. Structures	22		22
449 - Irrigation Water Mgmt	917.2	713.7	1630.9
DS - Dry Seeding	1416	258.2	1674.2
464 - Irrigation Land Leveling	1469.4		1469.4
590 - Nutrient Mgmt	0	6346.1	6346.1
595 - Pest Mgmt	0	6346.1	6346.1
646 - Shallow Water Mgmt for Wildlife	0	1684.3	1684.3



# Implementation and Improvement

## Mermentau River Basin



The Mermentau River Basin lies within southwestern Louisiana and encompasses the prairie region of the state and a portion of the coastal zone. The Basin is bordered on the east by the Vermilion-Teche Basin and on the west by the Calcasieu Basin. It is comprised of 20 watersheds. The majority of the land within this river basin is agricultural land, primarily rice, soybeans, sugarcane, and crawfish. The 2006 Integrated Report indicates that the majority of the water bodies within the Mermentau River Basin are not meeting the designated uses for fish and wildlife propagation because the dissolved oxygen standard can not be met during the summer months. During 1998,

# Implementation and Improvement

water quality surveys were conducted on these water bodies and in 2000, TMDLs were developed for the following six watersheds: Bayou des Cannes, Bayou Plaquemine Brule, Bayou Nezpique, Bayou Queue de Tortue, Mermentau River, and Bayou Lacassine. Watershed plans were developed for each of these watersheds in 2003. This was the first basin for which LDEQ's GIS Center began to work with the satellite imagery for classification of crop types within the watersheds.

During 2007, LDEQ continued to focus on the water quality problems that exist in the southwestern part of Louisiana, where rice fields, sugarcane and crawfish ponds dominate the landscape. These are difficult water bodies to work in because of the low flow, sluggish conditions and the naturally high organic levels that exist within the bayous. The historical water quality data for the water bodies within the Mermentau River Basin indicated fluctuating levels of the concentration of dissolved oxygen. Dissolved oxygen concentration relates to the protection of the water body for fish and wildlife propagation.

Average Dissolved Oxygen Concentrations Measured in mg/L for Selected Water Bodies in the Mermentau River Basin						
Water Body (subsegment)	1997	1998	2003	2004	2006	2007*
Mermentau River (050401)	3.24	3.63	3.43	4.1	3.65	2.59
Bayou Blue (050304)	no data	3.51	4.77	no data	no data	4.32
Bayou Lacassine (050601)	3.36	3.81	3.91	no data	no data	2.69
Castor Creek (050303)	no data	3.37	3.82	no data	no data	3.63
Grand Lake (050701)	no data	5.83	8.36	no data	no data	8.03
Bayou Nezpique (050301)	3.80	3.95	4.37	no data	no data	3.55
*partial year data in 2007						

LDEQ collects monthly water quality data each year for the Mermentau River, but samples the other water bodies on a 4-year cycle. The TMDLs for these water bodies indicated that there would need to be a 30-100% reduction, depending on the water body, of nonpoint source pollutant loading before these water bodies would meet the water quality standard for dissolved oxygen during critical conditions. LDEQ will sample these water bodies again in 2008 to determine if the watershed implementation strategy has been effective in improving water quality.

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for Selected Water Bodies in the Mermentau River Basin						
Water Body (subsegment)	1997	1998	2003	2004	2006	2007*
Mermentau River (050401)	368	467	4530	474	82	120
Bayou Blue (050304)	no data	269	1987	no data	no data	1579
Bayou Lacassine (050601)	109	194	192	no data	no data	1377
Castor Creek (050303)	no data	556	1764	no data	no data	1317
Grand Lake (050701)	no data	54	24	no data	no data	50
Bayou Nezpique (050301)	528	313	656	no data	no data	224
*partial year data in 2007						

The water quality data for fecal coliform indicates that many of the water bodies have improved since 2003. These data relate to protection of the primary and secondary contact recreation use.

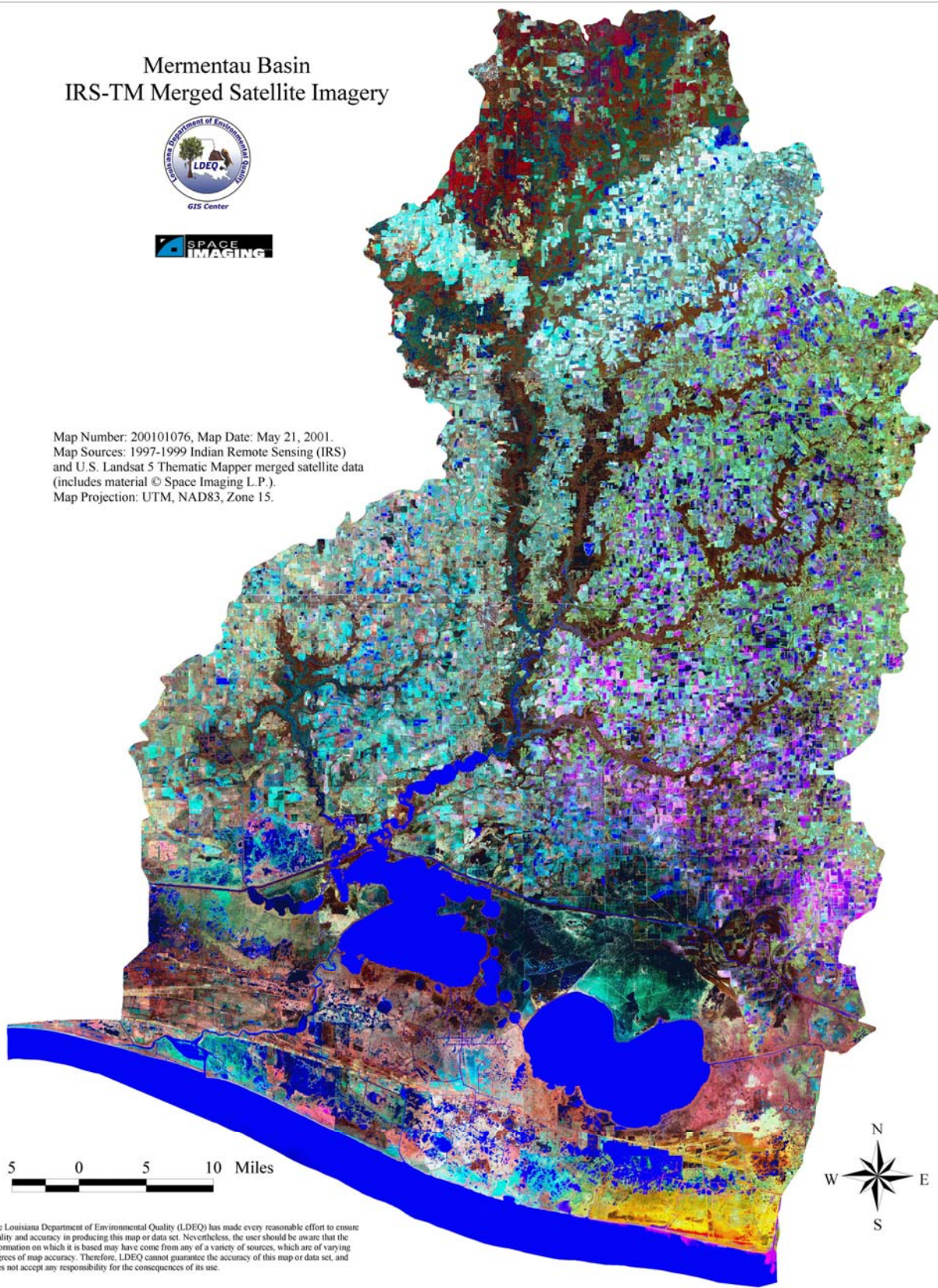


# Implementation and Improvement

## Mermentau Basin IRS-TM Merged Satellite Imagery



Map Number: 200101076, Map Date: May 21, 2001.  
Map Sources: 1997-1999 Indian Remote Sensing (IRS)  
and U.S. Landsat 5 Thematic Mapper merged satellite data  
(includes material © Space Imaging L.P.).  
Map Projection: UTM, NAD83, Zone 15.



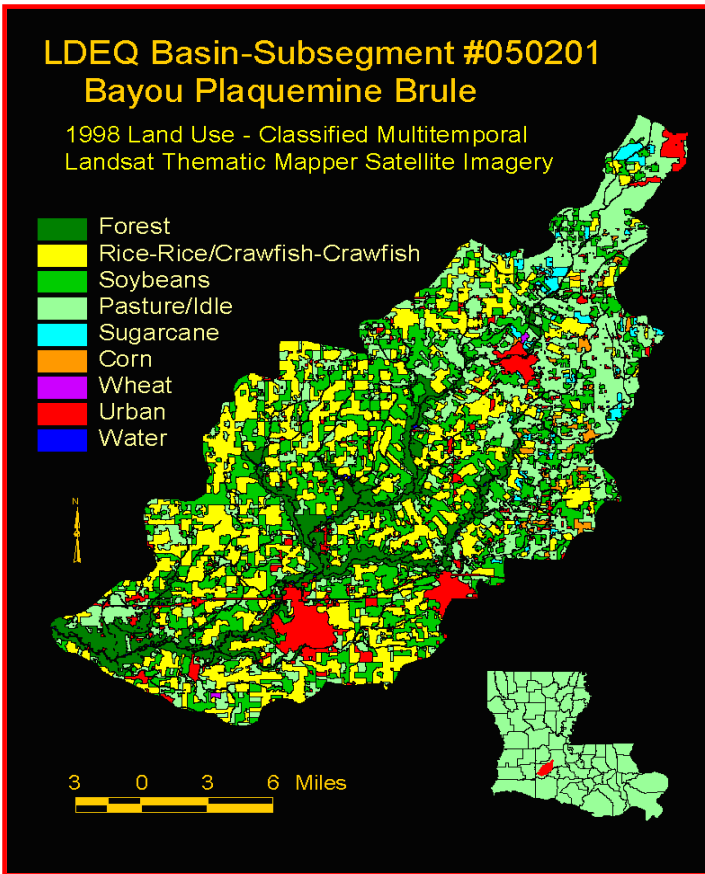
The Louisiana Department of Environmental Quality (LDEQ) has made every reasonable effort to ensure quality and accuracy in producing this map or data set. Nevertheless, the user should be aware that the information on which it is based may have come from any of a variety of sources, which are of varying degrees of map accuracy. Therefore, LDEQ cannot guarantee the accuracy of this map or data set, and does not accept any responsibility for the consequences of its use.



# Implementation and Improvement

## Modeling Nonpoint Source Pollution and Land Use Types in Bayou Plaquemine Brule Watershed

This project is scheduled to be completed in 2009. The Bayou Plaquemine Brule waterbody in the Mermentau River Basin in southwestern Louisiana is listed as impaired due to organic enrichment or low dissolved oxygen and fecal coliforms and is not meeting its designated uses for either fishing or swimming.



The specific goal of this project is to quantify the nonpoint source loads from land use types that exist in the Bayou Plaquemine Brule watershed. Spatial and temporal variation of nonpoint source pollutant sources and loading are being measured. The specific objectives are to quantify the daily loading of suspended solids and nutrients for Bayou Plaquemine Brule and its tributaries and to quantify the contribution of land use types such as soybeans, sugarcane, rice pastures on nonpoint source pollution in Bayou Plaquemine Brule. It will also evaluate the various BMPs implemented and their effects on nonpoint source pollution in the watershed. Finally, it will establish baseline information to quantify the effectiveness of best management practices in reducing pollution loads.

The 3-year surface water quality dataset that the University of Louisiana Lafayette will have at the end of the project will allow LDEQ to identify target areas in the

watershed where BMPs need to be implemented to improve water quality and to also track whether the on-going BMP implementation has been effective in reducing NPS pollutant loads and improving water quality.

### USDA and SWCD Programs

During 2007, the USDA implemented approximately 24,831 acres of BMPs within the Mermentau River Basin through the EQIP. An additional 445 acres of practices were implemented through the CRP, 24 acres of practices were implemented through the CSP, 240 acres of practices were implemented through the WRP, and 227 acres of practices were implemented through the WHIP.

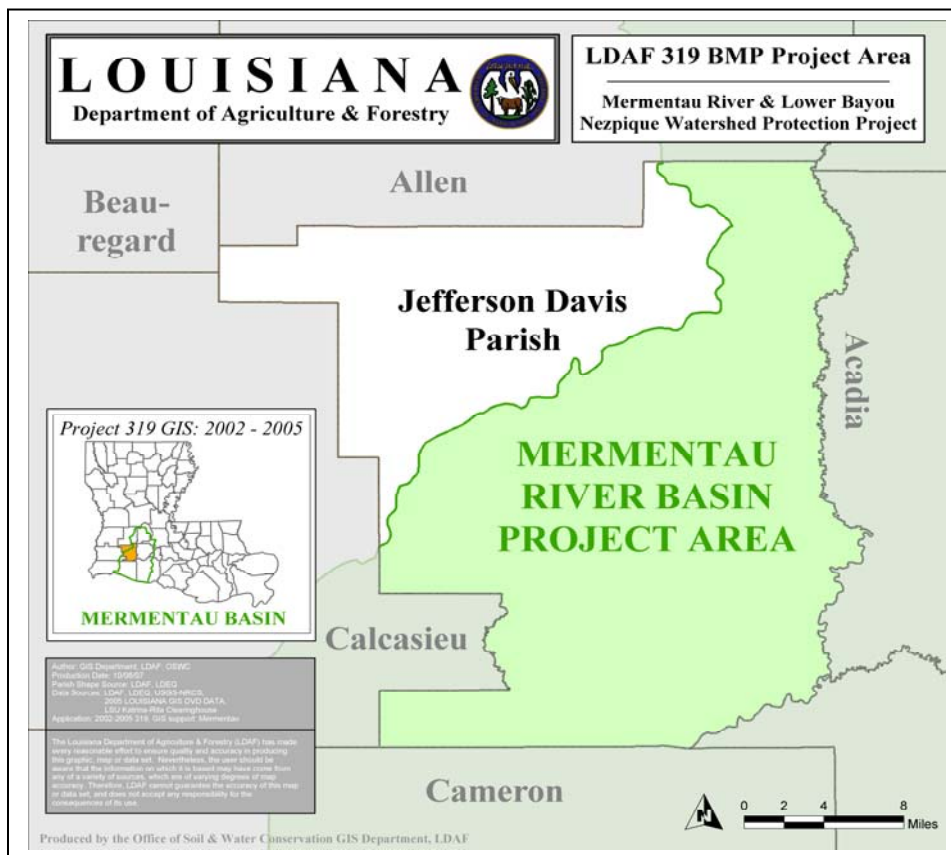
The Soil and Water Conservation District utilized Incremental 319 funds in the Mermentau River Basin. This money resulted in 1371 acres of agricultural BMPs implemented with federal funds and 30,303.7 acres with matching funds.

# Implementation and Improvement

In addition to the work that LDEQ funded in the Mermentau River Basin, the Office of Soil and Water Conservation funded a watershed implementation project. The Table and map that have been provided here indicate the type and acres of BMPs that were implemented through the incremental funds within the Mermentau River Basin.

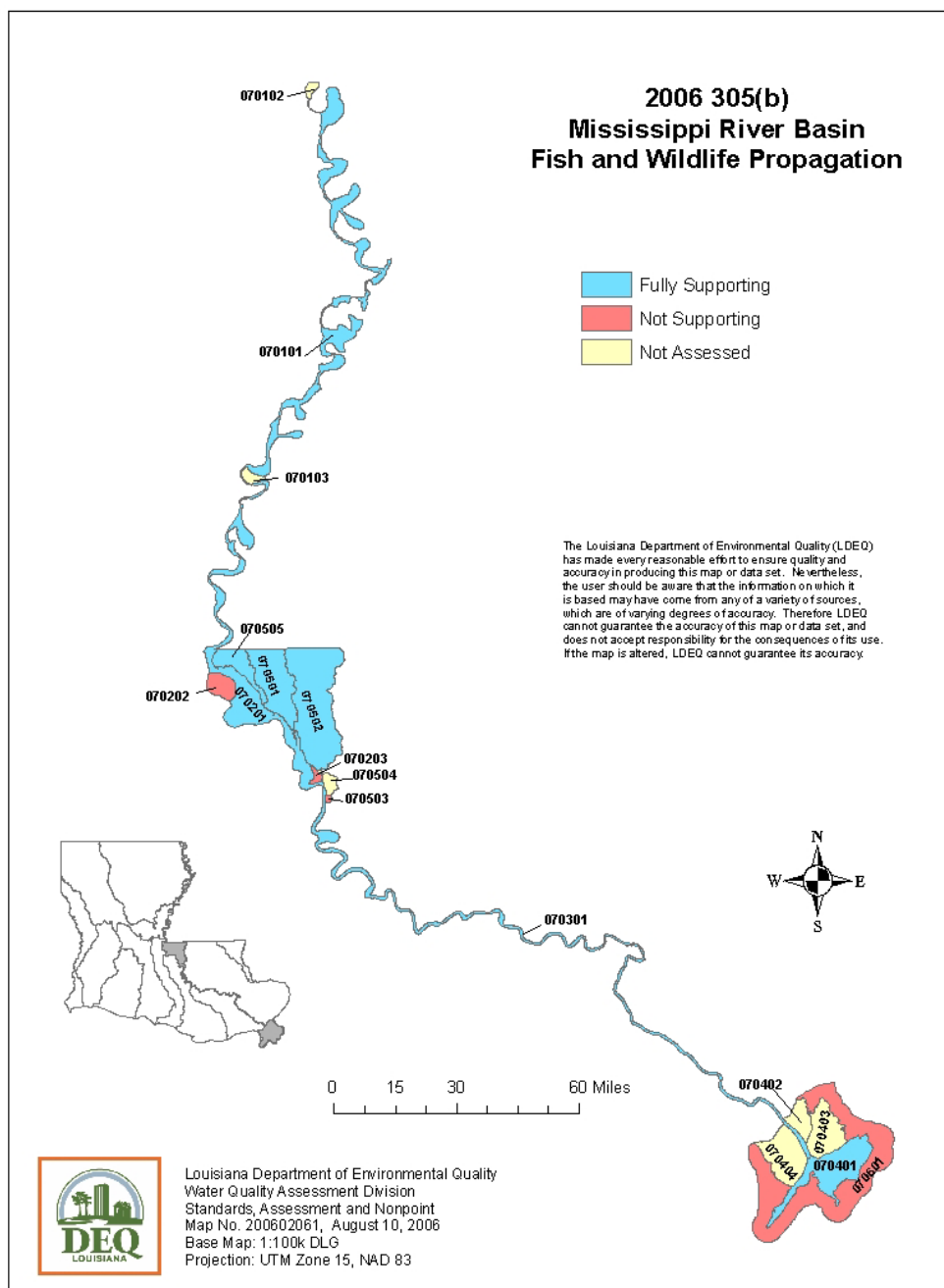
	Federal	Match	Totals
BMP	Ac/No.	Ac/No	Ac/No
328 - Conservation Crop Rotation	0	12485.6	12485.6
344 - Residue Mgmt Seasonal	76.8	10612.9	10689.7
410 - Grade Stab. Structures	22		22
449 - Irrigation Water Mgmt	206.6	210.2	416.8
DS - Dry Seeding	112.9	83.8	196.7
464 - Irrigation Land Leveling	953.1		953.1
590 - Nutrient Mgmt	0	2916	2916
595 - Pest Mgmt	0	2916	2916
646 - Shallow Water Mgmt for Wildlife	0	1079.2	1079.2

The project is in the western part of the basin and has resulted in 1371 acres of agricultural BMPs being implemented with the federal funds and 30,303.7 acres of BMPs implemented with matching funds.



# Implementation and Improvement

## Mississippi River Basin



The Louisiana reach of the Mississippi River is 504 miles long and courses through 17 parishes from East Carroll Parish at the Arkansas border to Plaquemines Parish on the Gulf of Mexico. Louisiana shares approximately 200 miles of river with the state of Mississippi. The west bank of the river in Louisiana from the Arkansas border at mile 504 to Venice, Louisiana near Head of Passes is leveed and has no tributary input. However, 30 percent of the Mississippi and Red River flows are diverted for flood control to form the Atchafalaya River with the Mississippi River flows coming



# Implementation and Improvement

through specially built structures near river mile 300. Also about 500 cfs flow is diverted into Bayou Lafourche at river mile 175.5 for drinking water purposes. The east bank of the river is leveed from the Arkansas border in Mississippi to Vicksburg and again from just north of Baton Rouge to Pointe A La Hache, south of New Orleans near river mile 49. Several tributaries enter the river from Mississippi including the Yazoo, Black, Homochitto and Buffalo Rivers and Bayou Pierre and from Bayou Sara, Thompson's Creek, and Tunica and Monte Sano Bayous in Louisiana. Controlled river diversions for flood control and coastal restoration also occur south of Baton Rouge on both sides of the river. LDEQ and predecessor agencies have had monitoring stations on the Mississippi River continuously since 1966.

The Mississippi River Basin comprises 17 sub-segments within Louisiana. The river is in full support of its designated uses from the Arkansas State line to the Old River Control Structure and on to Monte Sano Bayou and to Head of Passes. The water quality data indicated that the dissolved oxygen concentrations are good for Bayou Sara and Thompson Creek, but that there are fecal coliform problems that need to be addressed. TMDLs for the impaired water bodies within the Mississippi River Basin are scheduled to be completed by 2010.

Average Dissolved Oxygen Concentrations Measured in mg/L for Selected Water Bodies in the Mississippi River Basin			
Water Body (subsegment)	1998	2001	2005
Bayou Sara (070501)	no data	7.95	8.55
Thompson Creek (070502)	8.78	6.89	8.28

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for Selected Water Bodies in the Mississippi River Basin			
Water Body (subsegment)	1998	2001	2005
Bayou Sara (070501)	no data	643	868
Thompson Creek (070502)	878	581	888

## USDA Programs

During 2007, the USDA implemented approximately 3,859 acres of BMPs within the Mississippi River Basin through the EQIP. An additional 1,872 acres of practices were implemented through the CRP, 870 acres of practices were implemented through the WRP, and 97 acres of practices were implemented through the WHIP.

In addition to the work that LDEQ and other agencies do to improve water quality within the Mississippi River Basin in Louisiana, there are several interstate issues involving water quality improvement within the Mississippi River and the Gulf of Mexico. Some of the highlights of those efforts are included here. The Gulf of Mexico Program (GOMP) and the recently formed Gulf of Mexico Alliance (GOMA) have included the Gulf hypoxia issue as a topic area under their program efforts. LDEQ has been a member of the GOMP since its creation in 1989 and is also a charter member of the GOMA.

# Implementation and Improvement

Through the GOMP, LDEQ has participated on their nutrient enrichment committee for many years which included developing action plans for addressing a variety of nonpoint source (NPS) issues including agricultural runoff, urban runoff, construction activities, hydrological modifications and individual treatment systems. The development of action approaches to these issues has been an interstate process with Louisiana benefiting from the long term interactions with the other Gulf States of Florida, Alabama, Mississippi and Texas. Some Louisiana NPS issues that concern water quality issues in Louisiana coastal waters have been addressed in coordination with the GOMP.

This multi-state approach is also being used by the GOMA which was recently formed as a response to the Administration's 2004 U.S. Ocean Action Plan. In the action plan, the Gulf of Mexico got more attention and recognition than in any previous government report and the GOMA was formed by the Gulf State Governors to take advantage of this attention given to the Gulf. In order to help further that recognition and set the stage to apply for greater financial resources for the Gulf, the five Gulf state governors completed and released a "Governor's Action Plan for Healthy and Resilient Coasts" in 2006. Among the major topic areas being address by the GOMA are water quality for healthy beaches and shellfish beds which address harmful algal blooms, wetland and coastal conservation and restoration, identification and characterization of Gulf habitats, reducing nutrient inputs and environmental education. The Louisiana NPS Program will have an important role in helping to implement some of the GOMA action items in Louisiana coastal waters. The following websites contain more information on the Gulf of Mexico Program and the Gulf of Mexico Alliance:

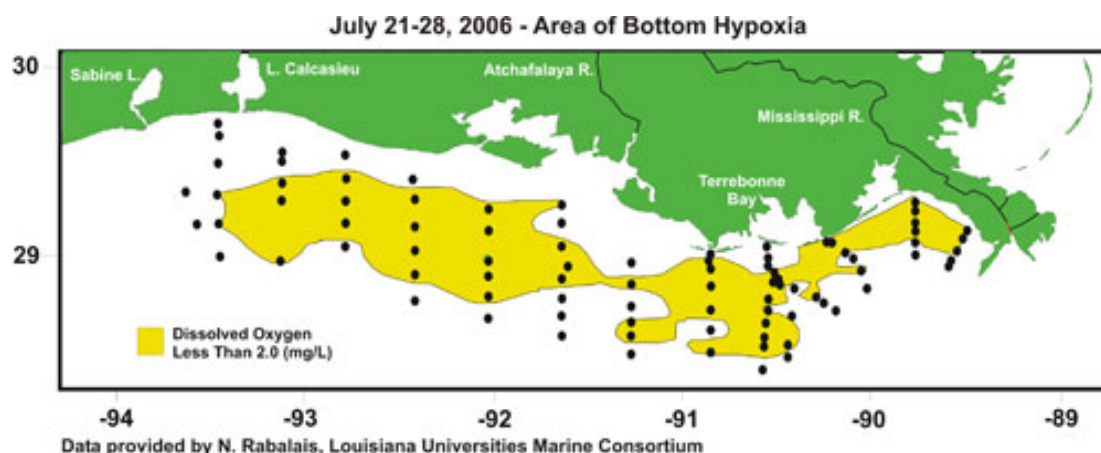
- [www.epa.gov/gmpo/](http://www.epa.gov/gmpo/)
- [www.dep.state.fl.us/gulf/default.htm](http://www.dep.state.fl.us/gulf/default.htm)
- [www2.nos.noaa.gov/gomex/welcome.html](http://www2.nos.noaa.gov/gomex/welcome.html)



# Implementation and Improvement

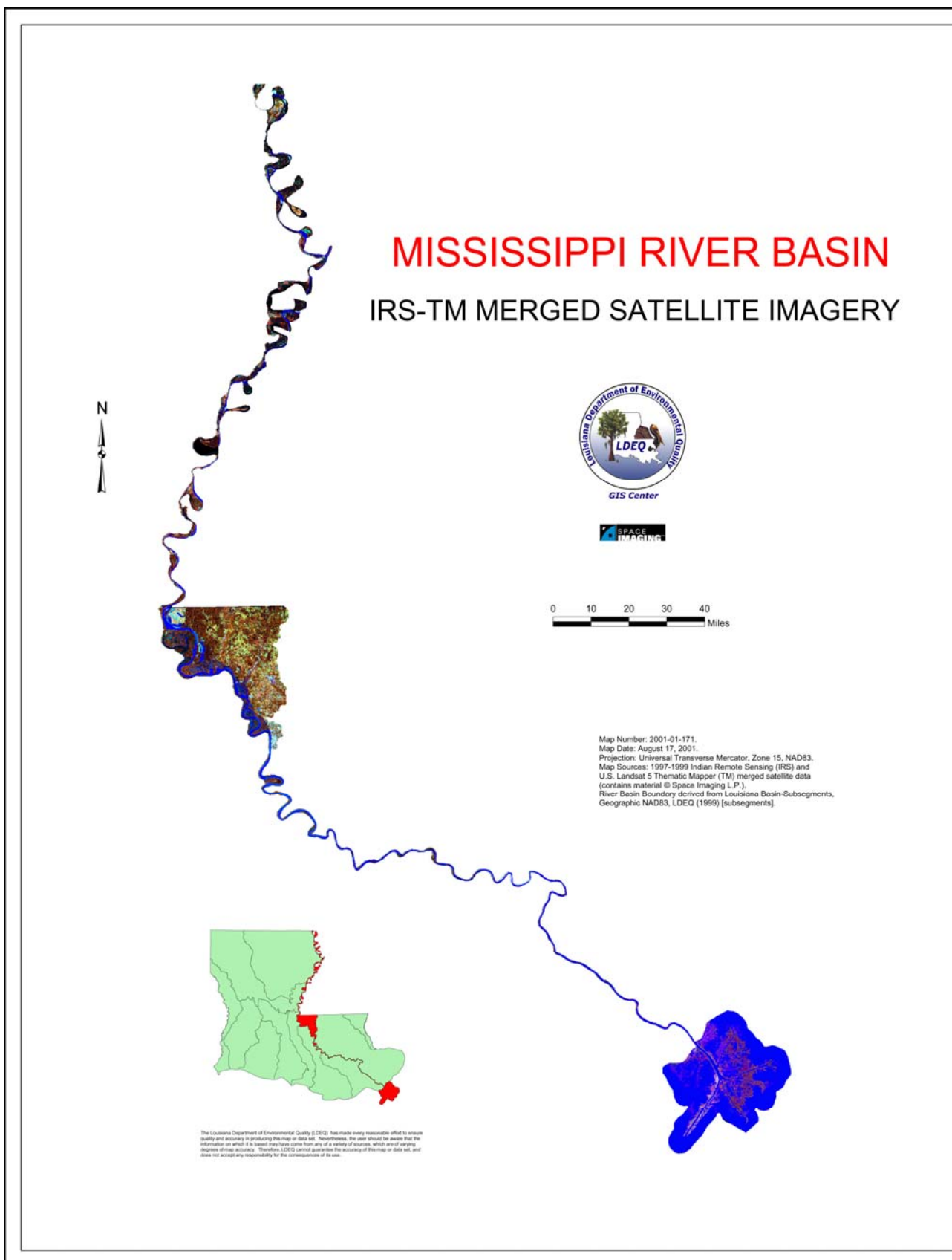
Since the Mississippi River basin includes all or parts of 31 states and two Canadian provinces, LDEQ has partnered with multi-state programs to help monitor, evaluate and protect Mississippi water quality. And since many water quality conditions in the Louisiana section of the Mississippi River are reflective of upstream NPS runoff, the NPS program has played a role in Mississippi River water quality issues. Among multi-state river partners is the Lower Mississippi River Conservation Committee (LMRCC). The LMRCC was formed in 1994 with the mission of promoting the protection, restoration, enhancement, understanding, awareness and wise use of the natural resources of the Lower Mississippi River. The LMRCC accomplishes this mission through coordinated and cooperative efforts involving research, planning, management, information sharing, public education and advocacy. Members of the LMRCC include representatives of the fish and game and water quality agencies from the six lower river states of Missouri, Kentucky, Tennessee, Arkansas, Mississippi and Louisiana. LDEQ is a charter member of the LMRCC and has actively participated in the Water Quality Technical Committee. Through the LMRCC, LDEQ has coordinated with other river state water quality agencies to further define water quality issues in the River. A special water quality edition of the LMRCC newsletter in 1996 became the most requested newsletter at that time indicating the importance of Mississippi River water quality. The LMRCC has also promoted interagency coordination on the Gulf hypoxia issue and in the development of an Aquatic Resource Management Plan as well as continuing to support the state NPS Management Programs.

The other major interstate program that LDEQ participates in is the Lower Mississippi River Sub Basin Committee on Hypoxia. This committee was developed under the National Hypoxia Task Force and functions to coordinate implementation of the Hypoxia Action Plan by major sub-basins including coordination among smaller watersheds, Tribes and States in each of those sub-basins. Recently the lower sub basin committee has coordinated with the LMRCC for greater unity since the state members of the sub basin committee are the same as for the LMRCC. The sub basin committee also includes members of the hypoxia task force federal agencies including USDA-NRCS, USGS, ACOE, and NOAA. One of the main actions of the sub basin committee is the identification of pilot watershed projects in each state for demonstrating nutrient reduction practices. Louisiana has chosen the Cabin-Teele watershed in the Tensas River Basin and Upper Mississippi River Alluvial Plains Ecoregion of northeast Louisiana which has also received Louisiana NPS funding for BMP development and implementation. Through the support of the sub basin committee, funding is being sought to further the monitoring of nutrient reducing BMPs in the Cabin-Teele watershed with the support of the USDA's Agricultural Research Service office in Baton Rouge.



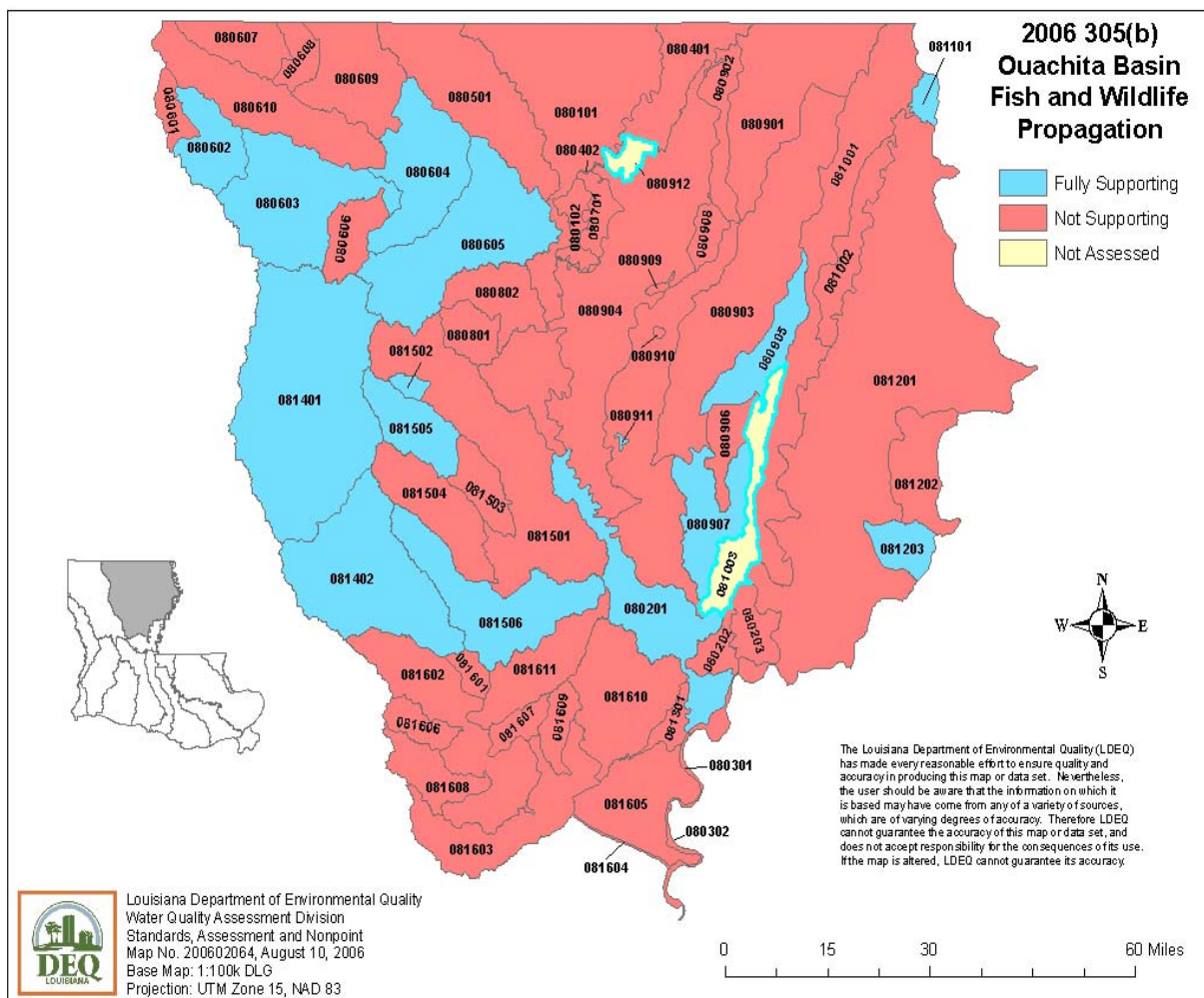


# Implementation and Improvement



## Implementation and Improvement

## Ouachita River Basin



The Ouachita River Basin lies within northeastern Louisiana and is bordered on the east by the Mississippi River and on the west by the Red River Basin. The Ouachita River flows through the basin from Arkansas and joins with the Tensas River to form the Black River. The Ouachita River bisects the basin, with primarily row crop agriculture in the eastern half, and forestry in the western half.

During 1999, water quality surveys were conducted for all of the water bodies that were included on the 303(d) list of impaired waters and were scheduled to have TMDLs developed for them. Approximately 23 TMDLs were completed by LDEQ and EPA Region 6 in 2002 and 2003 for the impaired water bodies within the Ouachita River Basin. The NPS Unit has worked with the Agricultural Research Service to develop thirteen watershed plans.

Nonpoint source pollutant loading was identified as the primary factor that contributed to the water quality impairments in this river basin, with a range of load reductions from 50 to 100% to

# Implementation and Improvement

meet water quality standards. The 2006 Integrated Report indicated that 32 of the water bodies were not meeting the fish and wildlife propagation use, but mercury and turbidity were the primary problems, with only a few water bodies impaired because of dissolved oxygen. The Ouachita River Basin is a diverse system with urban areas, forests, pastures and croplands, so there have been a wide range of projects implemented there in order to address the various sources of pollution that exist. LDEQ collected water quality data in the Ouachita Basin during 2004 and 2005. Water quality data will be collected again during 2008 to determine whether the watershed projects that have been implemented have resulted in reductions of nonpoint source pollutants and improvements in water quality. These dissolved oxygen data indicate that the water quality has improved in the Ouachita River, Bayou Bartholomew, and Castor Creek.

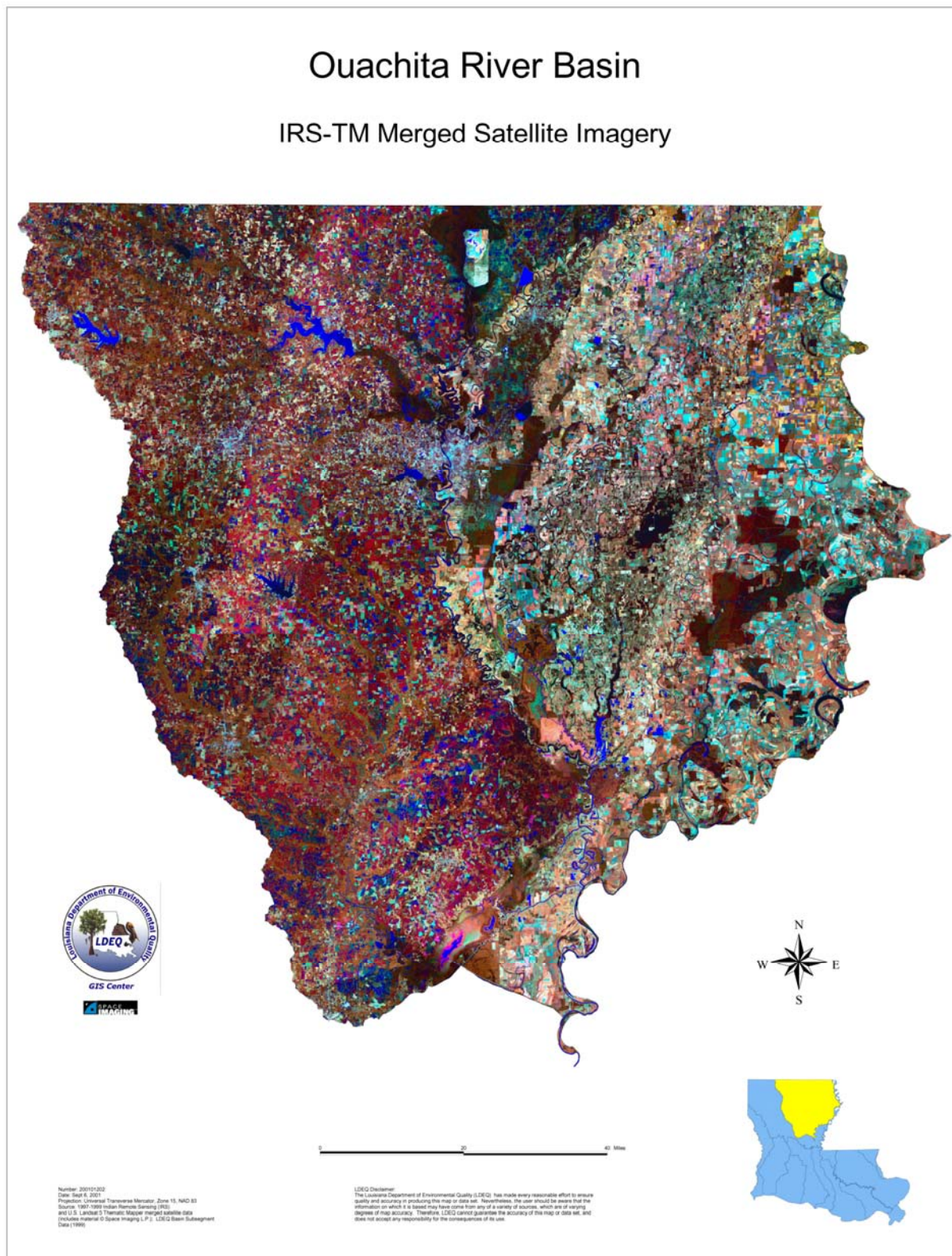
Average Dissolved Oxygen Concentrations Measured in mg/L for Selected Water Bodies in the Ouachita River Basin					
Water Body (subsegment)	1999	2004	2005	2006	2007*
Ouachita River (080101)	5.83	5.92	5.90	6.06	6.19
Bayou Bartholomew (080401)	6.53	6.43	no data	6.70	no data
Boeuf River (080901)	5.91	no data	5.22	no data	no data
Bayou De L'Outre (080501)	5.56	4.72	no data	5.04	no data
Joe's Bayou (081002)	6.11	no data	4.95	5.59	no data
Tensas River (081201)	5.89	5.36	6.85	6.70	5.72
Bayou Chauvin (080102)	4.59	4.36	no data	no data	4.56
Big Creek (080903)	6.78	no data	5.28	no data	no data
Bayou Desiard (080701)	6.91	no data	7.05	no data	5.95
Middle Fork Bayou D'Arbonne (080610)	5.29	no data	5.07	no data	5.15
Castor Creek (081501)	6.13	no data	7.54	no data	no data
*partial year data in 2007					

The data for fecal coliform indicates that most of the water bodies in the Ouachita River Basin has either improved or remained fairly constant.

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for Selected Water Bodies in the Ouachita River Basin					
Water Body (subsegment)	1999	2004	2005	2006	2007*
Ouachita River (080101)	127	163	35	94	168
Bayou Bartholomew (080401)	334	266	no data	119	no data
Boeuf River (080901)	403	no data	167	no data	no data
Bayou De L'Outre (080501)	264	196	no data	44	no data
Joe's Bayou (081002)	576	no data	1229	611	no data
Tensas River (081201)	141	265	226	83	54
Bayou Chauvin (080102)	2154	4688	no data	no data	657
Big Creek (080903)	249	no data	250	no data	no data
Bayou Desiard (080701)	385	no data	342	no data	278
Middle Fork Bayou D'Arbonne (080610)	389	no data	244	no data	81
Castor Creek (081501)	196	no data	265	no data	no data
*partial year data in 2007					



# Implementation and Improvement

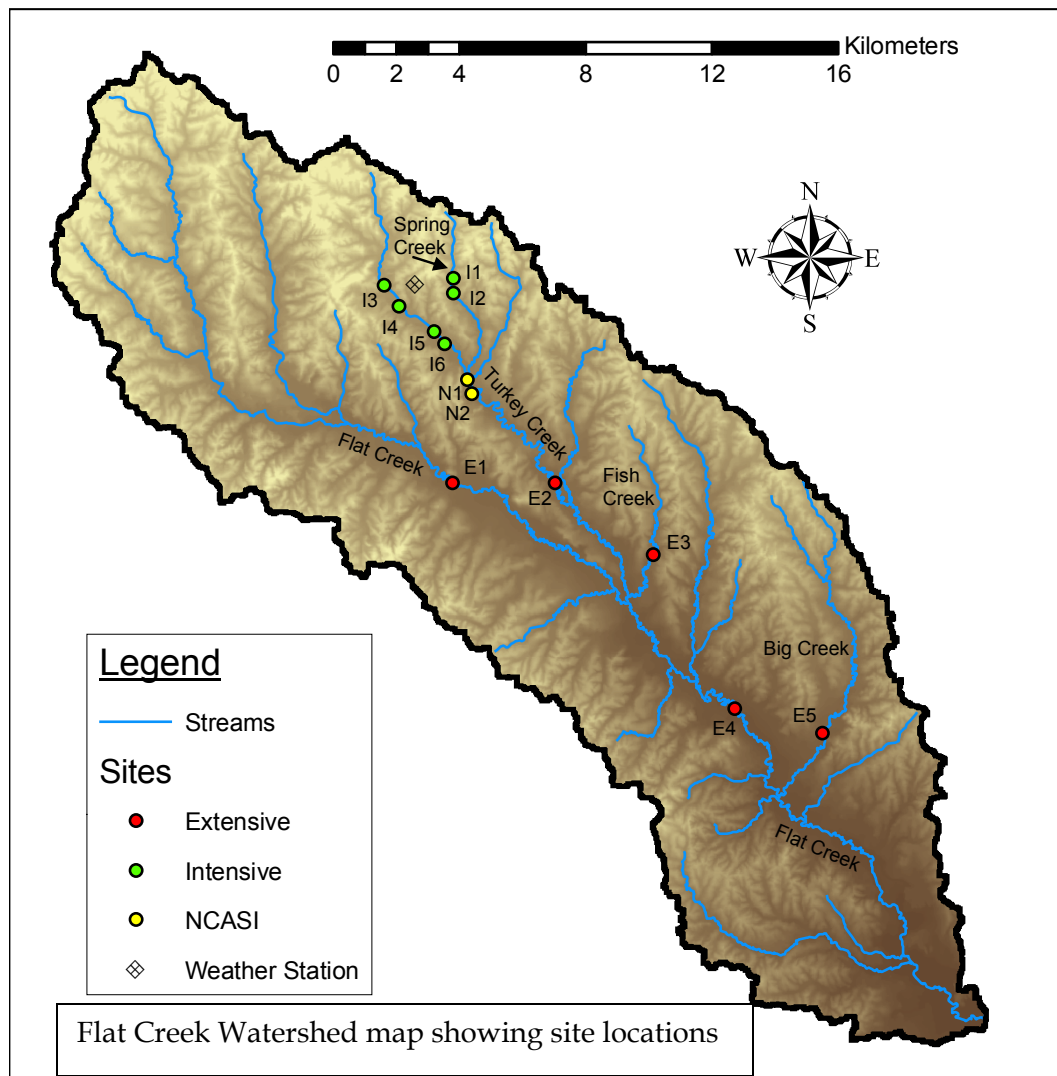




# Implementation and Improvement

## Monitoring the Effectiveness of Forestry BMP Implementation in the Flat Creek Watershed

This project is scheduled to be completed in 2009. This project was initiated in 2003 to address two critical questions: 1) Are Louisiana's current forestry BMPs effective in maintaining or improving the quality of low-gradient headwater streams often having low DO and high trophic levels? and 2) Will forestry BMP implementation bring any basin-wide benefits in water quality protection? To answer these questions the Flat Creek watershed was selected, which broadly represents the forested landscape in this region. The project employed a paired watershed design with intensive field monitoring of stream water quality for a pre-harvest period and a post-harvest period. Timber harvest was completed in November 2007 and post-harvest water quality data is currently being collected.



This project has gained important preliminary findings for the pre-harvest period. Monthly dissolved oxygen (DO) levels ranged from 0.4 to 9.0 mg L<sup>-1</sup> with the lowest levels generally occurring from May to July, a period in which decreased organic carbon and increased inorganic carbon were found. There was a wide range of nutrient concentrations, especially nitrate/nitrite

# Implementation and Improvement

(0.127-1.378 mg L<sup>-1</sup>). Suspended and dissolved solid loading was mainly controlled by discharge levels, as concentrations of solids did not vary extensively.

Despite the low DO conditions, headwater streams in the Flat Creek watershed showed a high abundance of macroinvertebrates, especially general taxa adapted to low DO conditions. A positive relationship existed between DO levels and the burrowing mayfly, *Hexagenia*, suggesting that this taxon may be used as an indicator of water quality for low-gradient, headwater streams in the South Coastal Plains Ecoregion, to which a large part of the state of Louisiana belongs. Most macroinvertebrate metrics were not significantly different between seasons, while spatial variations were clearly reflected by many of the metrics when sites were partitioned by stream permanence and DO level. There was no clear trend between the macroinvertebrate assemblage and stream order. Localized flow conditions affected macroinvertebrates more than the stream position in this watershed, implying that the selection of sampling locations was ultimately crucial to ensure representation of biological stream conditions across a watershed.

## **The Delta Technical Assistance Program for BMP Implementations and Reduction of NPS Pollution**

The Final Report for this project was approved by EPA in 2007. For impaired water bodies in the Northeast Delta Resource Conservation and Development (RC&D) Area, water quality was greatly improved due to the availability of technical services, the educational outreach effort to inform the public on the importance of best management practices and the use of best management practices. As a result of the project, approximately 8,074 conservation plans were designed and implemented. These plans consisted of basic conservation plans, and contracts for the Environmental Quality Incentive Program, Wetland Reserve Program, Wildlife Habitat Incentive Program, Conservation Reserve Program and Continuous Conservation Reserve Programs.



Fence built for Prescribed Grazing Program

During the duration of this project, Louisiana's approved best management practices (BMPs) were implemented on several hundred acres in the Ouachita River Basin. During the project period, eight conservation technicians were hired to provide technical services to eleven parishes working with seven different soil and water conservation districts. These technicians were trained on best management practices and about the benefits and importance of best management practices. They were trained that BMPs or combinations of practices are an effective, practical, structural or nonstructural method to prevent or reduce the movement of sediment, nutrients, pesticides and other pollutants from the land to surface or ground water.

An educational program was established and was a very effective part for this project. This program resulted in continuous day-to-day outreach efforts to inform the landowners/users about

# *Implementation and Improvement*

informational materials available to them. These materials were distributed to the landowners/users; mail outs were sent to the local community and newsletters and newspaper articles were developed. Field days, workshops and seminars were conducted during the project period to inform the landowners/users about BMPs. Newsletters were sent out on a quarterly basis to local landowners and producers to inform them about the different BMPs that will best enhance their land and bodies of water. Each BMP that was planned and implemented was explained to the landowners/users. Each BMP consisted of a national conservation practice standard sheet that explains the definition, purpose and conditions where practices are applied. These technicians assisted in the annual Wild Woods Wandering Environmental Camps, which are two one-week camps for high school level students throughout the state, for all three years of the project. The main purpose of this camp was to allow the high school students in Louisiana to experience first-hand the diverse dynamics of a forested wetland ecosystem within a predominately agricultural watershed.

They assisted in developing over 8,000 conservation plans for landowners, farm producers and local units of government in the Delta. Northeast Delta RC&D was and is very proud of the success of this project. From this project, landowners/users were able to receive technical service when previously they were unable to due to lack of staff members to meet the demanding workload in the soil and water conservation district offices. The RC&D Council proudly spreads the word on the success of the Delta TAP project at area, regional, and national meetings as well as local conservation district board, police jury and community meetings. This project has been discussed at area, state and regional USDA-NRCS meetings.

## USDA and SWCD Programs

During 2007, the USDA implemented approximately 50,060 acres of BMPs within the Ouachita River Basin through the EQIP. An additional 23,152 acres of practices were implemented through the CRP, 11,947 acres of practices were implemented through the WRP, and 684 acres of practices were implemented through the WHIP. In addition to these Farm Bill Programs, USDA worked with the local SWCDs on implementation of the Conservation Reserve Enhancement Program in which almost 50,000 acres of land have been taken out of production.

The Soil and Water Conservation District implemented agricultural BMPs with the Incremental 319 funds in the Ouachita Basin, specifically in the Turkey Creek and Turkey Creek Extension watershed. During 2007, more than 6800 acres of BMPs were implemented within this watershed area.

In addition to the work that LDEQ has funded through the NPS Program, the Office of Soil and Water Conservation has also implemented agricultural BMPs in the Ouachita River Basin within the Turkey Creek watershed area. The map and table provide information on the location of the project, the types and acres of BMPs that have been implemented.



## Implementation and Improvement



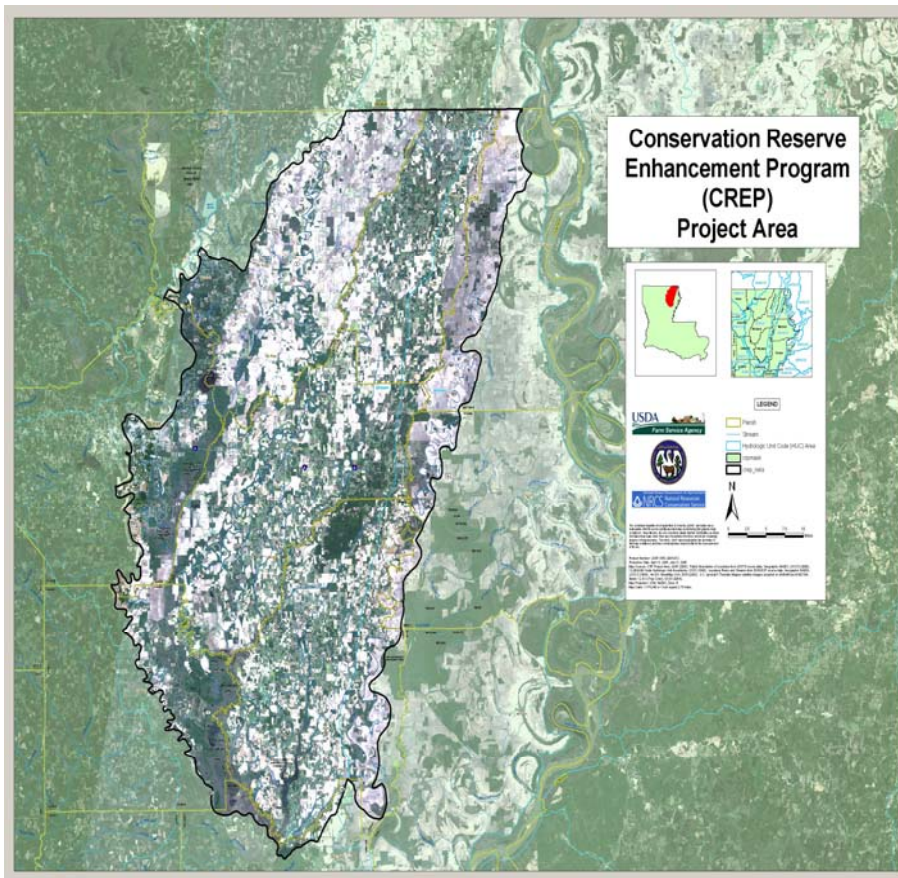
USDA and the Office of Soil and Water Conservation have also continued to work on the Conservation Reserve Enhancement Program (CREP) to take some of the most highly erodible lands out of production within the eastern part of the Ouachita River Basin. Through this program, there have been 715 contracts implemented for approximately 50,000 acres of land taken out of production and planted in trees or grasses. The map included within the report shows the area where the CREP I project has been implemented.

## Turkey Creek Implemented Practices 07

Practice Code	Description	Turkey Creek 1	Turkey Creek II
462	Precision Land Forming	268.18	62.97
484	Mulching	1.5	
342	Critical Area	3	
410	Grade Stabilization Structure	2	
382	Fence	12986ft	12315ft
512	Pasture Planting	161.3	103.6
642	Water Well	3	
430EE	Irrigation Pipeline	3586	
516	Pipeline	1224	
614	Water Facility	1	
561	Heavy Use Pad	1	
328	Conservation Crop Rotation	1027.7	
344	Residue Mng., Seasonal	1072.6	
386	Field Border	215140ft	12800ft
449	Irrigation Water Management	208	
528	Prescribed Grazing	185.3	96.7
590	Nutrient Management	1297.4	230.3
595	Pest Management	1864.4	230.3

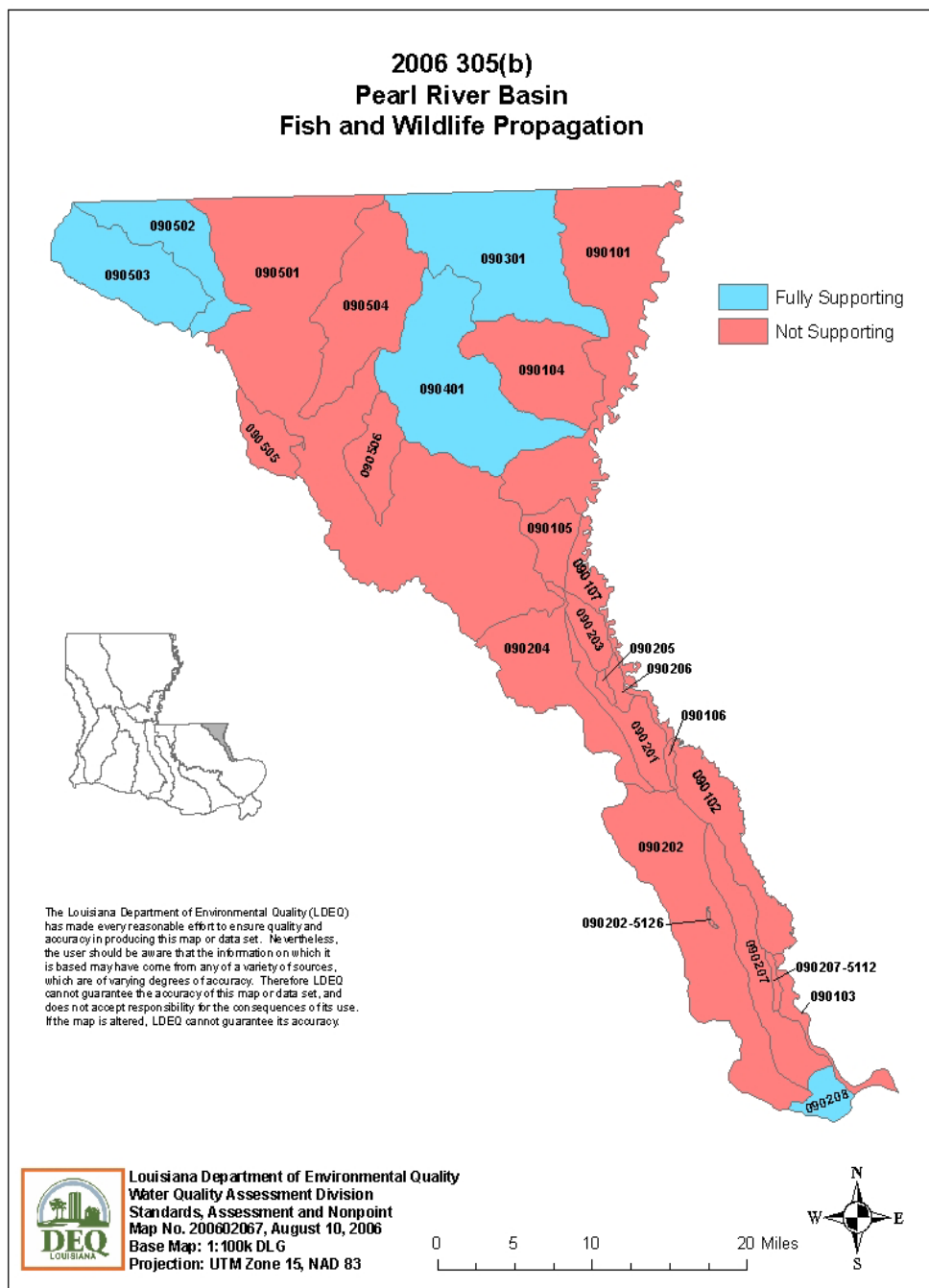


# *Implementation and Improvement*



# Implementation and Improvement

## Pearl River Basin



The Pearl River Basin lies along the Louisiana-Mississippi border and is bordered on the north by the Mississippi state line and on south by Lake Pontchartrain. The 2006 Integrated Report indicated that water quality problems primarily were associated with fecal coliform bacteria, turbidity and mercury. The fecal coliform problems were attributed to on-site disposal systems, wildlife and waterfowl. The turbidity problems were associated with silviculture, sand and gravel mining and

# Implementation and Improvement

sources from outside of the state. TMDLs are scheduled for these impaired water bodies in 2008 and 2009.

During 2007, LDEQ continued to collect water quality data for many of the water bodies within the Pearl River Basin. The water quality data for the Pearl River indicates that the dissolved oxygen concentration continues to meet water quality standards, thereby supporting the fish and wildlife propagation use.

Average Dissolved Oxygen Concentrations Measured in mg/L for Selected Water Bodies in the Pearl River Basin							
Water Body (subsegment)	1996	1997	1998	2001	2005	2006	2007*
Pearl River (090101)	8.84	9.73	7.95	7.56	no data	6.75	no data
*partial year data in 2007							

The fecal coliform concentration in the Pearl River has fluctuated widely since 1996, but the data from 2006 seems to be lower than in the previous years.

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for Selected Water Bodies in the Pearl River Basin							
Water Body (subsegment)	1996	1997	1998	2001	2005	2006	2007*
Pearl River (090101)	144	483	3854	509	no data	194	no data
*partial year data in 2007							

## USDA Programs

In the Pearl River Basin, the USDA implemented approximately 2,300 acres of BMPs through the EQIP in 2007. An additional 647 acres of practices were implemented through the CRP, 9 acres of practices were implemented through the GRP, and 188 acres of practices were implemented through the WHIP.



The White Kitchen Preserve



# *Implementation and Improvement*

## Development of Site Conservation Plan and Addressing NPS Pollution on the Pearl River, Louisiana

The Final Report for this project was approved by EPA in 2007. The overall goals of this project were to work with experts to develop a conservation plan for the Pearl River that identifies priority sites and potential problems; to survey state agencies about their roles in sand and gravel operations in the state (sand and gravel mining is prevalent in the project area); and to educate all partners and private citizens about watershed protection within the Pearl River Basin.

The Pearl River educational brochure was completed. Ten thousand copies were printed and distribution is underway. Three stakeholder field trips were held along the West Pearl River and into Honey Island Swamp in April and May of 2006. The Pearl River Symposium was held in Jackson, Mississippi on May 5 and 6, 2006. Approximately 82 participants from 40 agencies/groups attended to discuss the ecological values of the Pearl River, water quality issues, smart growth and watershed management.

A Technical Advisory Committee meeting was held on June 23, 2006. The Louisiana Nature Conservancy worked with participants from federal and state agencies to review priorities for conservation action. It is planned that this new group may help guide future conservation efforts. The Nature Conservancy has worked with state agencies that have relevant oversight and drafted a report on sand and gravel mining in Louisiana.



The Pearl River



# Implementation and Improvement



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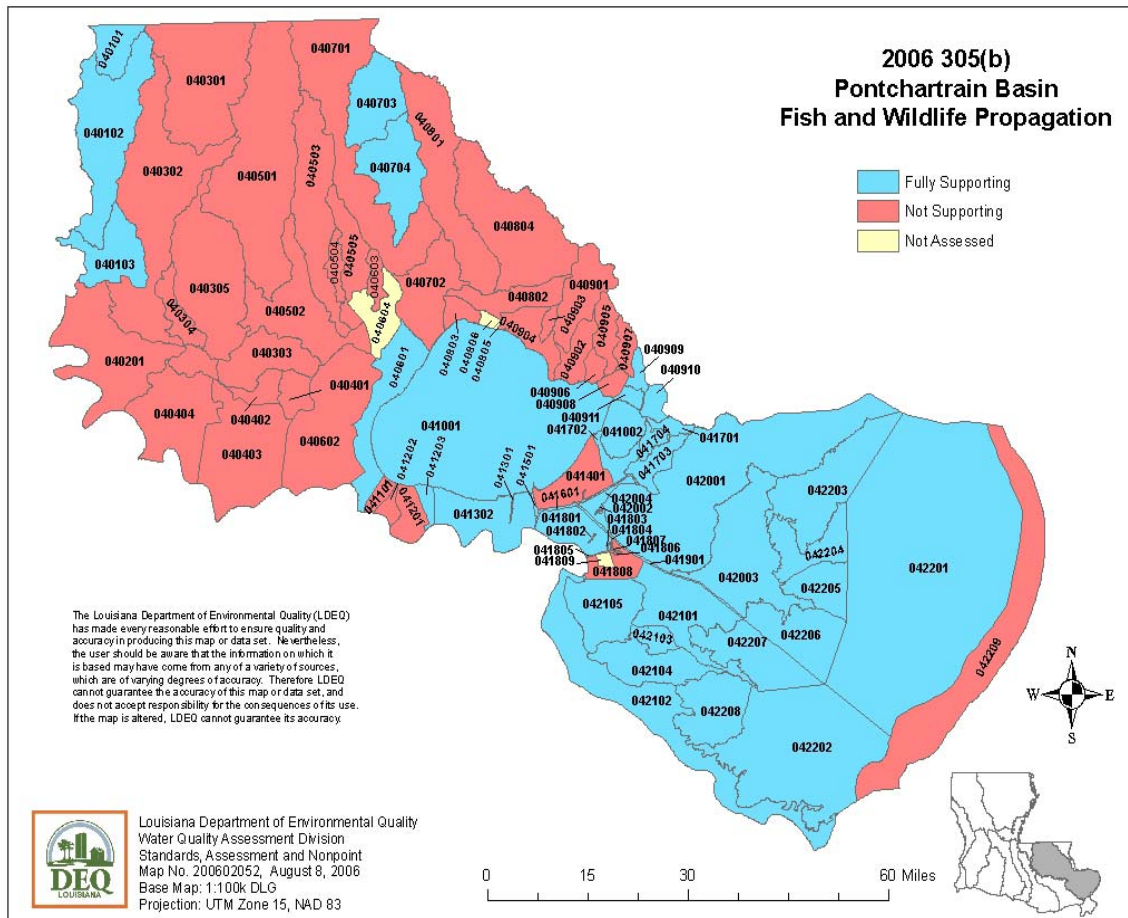


**Priority Conservation Sites  
in the Pearl River Basin  
in Louisiana and southern Mississippi**

Priority Conservation Sites	Federal and State lands
Primary Conservation Area Boundary	The Nature Conservancy preserves
Pearl River Basin	

# Implementation and Improvement

## Pontchartrain Basin



The Pontchartrain Basin lies within southeastern Louisiana and is comprised of tributaries and distributaries of Pontchartrain. The Breton and Chandeleur Sounds bound the basin on the south, the Mississippi state line is the northern border of the basin, and the Mississippi River levee is the western border and the Pearl River Basin is the eastern border of the Basin. The land-use within the Pontchartrain Basin ranges from pasturelands and forests in the north, to growing communities along the north shore. The lands within the southern part of the basin are primarily cypress tupelo forests and marshes, both fresh water and saline.

TMDLs for the impaired water bodies within the Pontchartrain Basin are scheduled to be developed during 2007-2011. The water quality surveys for these water bodies began in 2007 and the detailed land-use data for satellite imagery for the entire basin was collected in 2007. Watershed plans are scheduled to be developed during 2010-2014, but will actually begin as soon TMDLs for some of the water bodies have been completed. The 2006 Integrated Report indicated that most of the water bodies were meeting the water quality standard for dissolved oxygen, but were not fully meeting the designated use for fish and wildlife propagation because of mercury. Many of the

# Implementation and Improvement

water bodies did not meet the primary contact recreation use because of fecal coliform concentrations.

During 2007, LDEQ continued to collect water quality data for many of the water bodies within the Pontchartrain Basin. Data from several of these water bodies have been included here to provide information on the whether the water quality is improving or not. The data indicates the average concentration of dissolved oxygen for all of the water bodies (except Bayou Manchac) indicate good water quality, with the dissolved oxygen levels exceeding the water quality standard for fish and wildlife propagation.

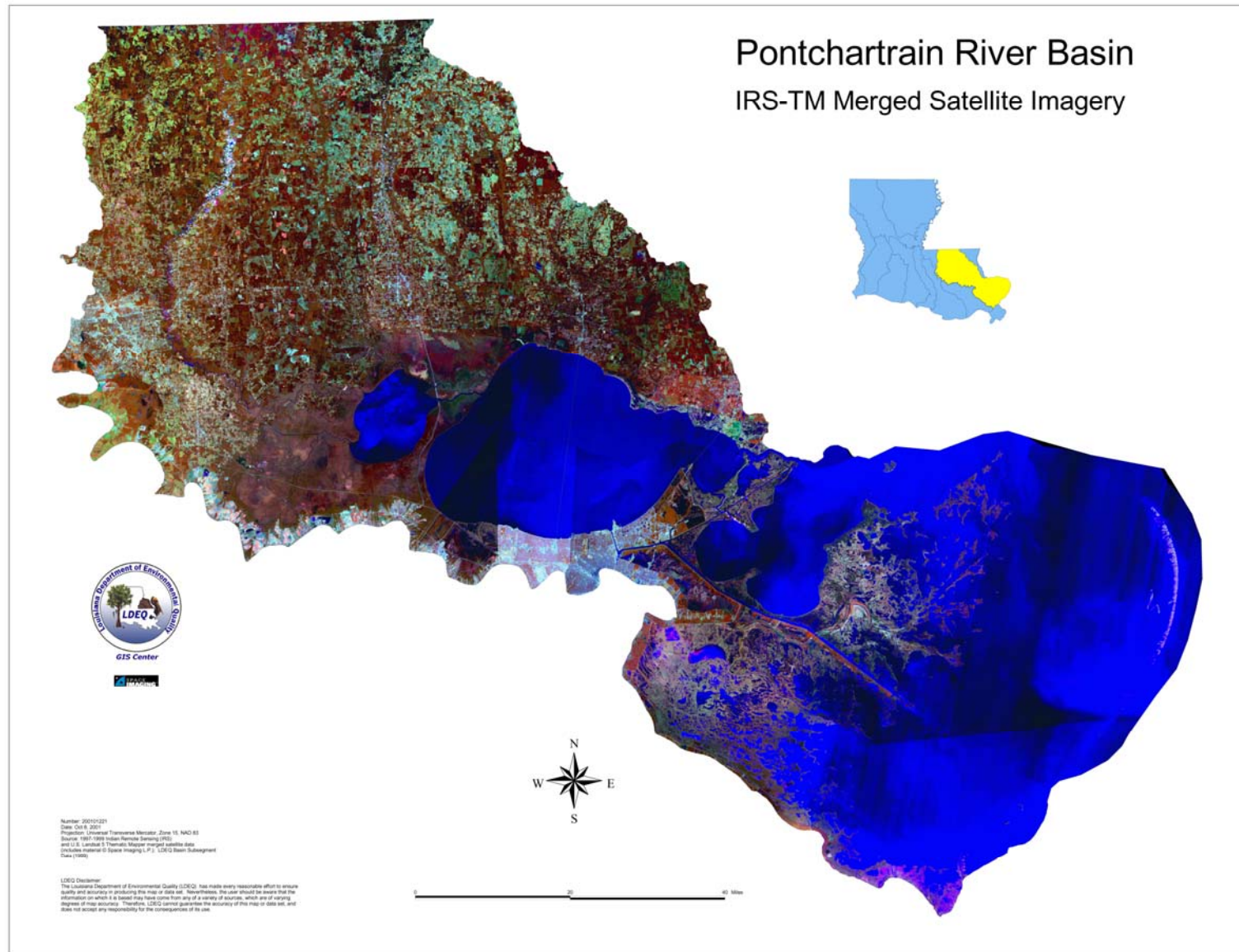
Average Dissolved Oxygen Concentrations Measured in mg/L for Selected Water Bodies in the Pontchartrain Basin											
Water Body (sub-segment)	1996	1997	1998	2000	2001	2002	2003	2004	2005	2006	2007*
Tickfaw River (040501)	no data	no data	no data	8.09	7.36	7.69	7.67	7.60	8.17	8.06	7.71
Tangipahoa River (040701)	no data	no data	no data	8.43	7.67	7.83	8.12	8.08	7.80	8.36	8.12
Bayou Manchac (040201)	3.46	3.38	3.41	no data	3.87	no data	no data	no data	2.31	no data	no data
Tchefuncte River (040801)	8.83	8.68	8.73	no data	7.77	no data	no data	no data	no data	no data	7.74
Amite River (040301)	5.45	6.31	6.35	no data	8.06	no data	no data	no data	no data	no data	8.27
*partial year data in 2007											

The fecal coliform data indicated a wide range of values that fluctuated with rain fall events. Overall, the water bodies appear to have a decreasing level of fecal coliform bacteria in 2007.

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for Selected Water Bodies in the Pontchartrain Basin											
Water Body (subsegment)	1996	1997	1998	2000	2001	2002	2003	2004	2005	2006	2007*
Tickfaw River (040501)	no data	no data	no data	114	644	2308	717	1399	814	579	233
Tangipahoa River (040701)	no data	no data	no data	100	282	3078	1998	2589	680	1203	240
Bayou Manchac (040201)	10,150	4305	3244	no data	3132	no data	no data	no data	814	no data	no data
Tchefuncte River (040801)	433	676	6007	no data	722	no data	no data	no data	no data	no data	132
Amite River (040301)	291	733	512	no data	854	no data	no data	no data	no data	no data	29
*partial year data in 2007											



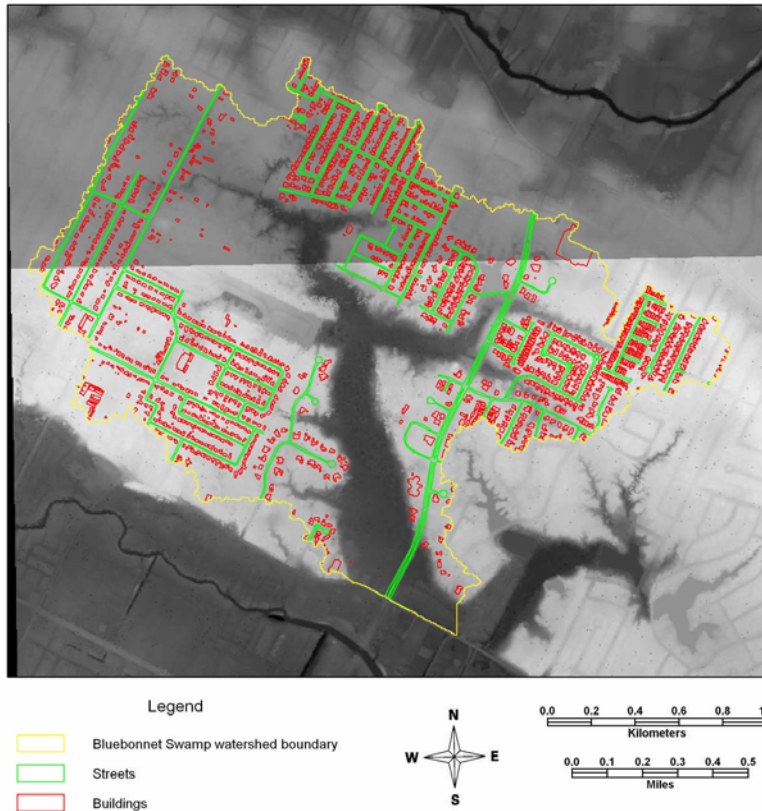
# Implementation and Improvement





# Implementation and Improvement

## Mitigating NPS Pollution in Urban Watersheds with Spatial Modeling, BMPs for Wetlands, and Community Outreach



Buildings and streets as determined from 1996 aerial imagery by City-Parish Planning Commission in the Bluebonnet Swamp watershed displayed over LiDAR DEMs.

This project ended in 2007 and the final report is being reviewed. This project provided information on the contribution of urban runoff to wetlands and drainages within the Bayou Manchac and Amite River watersheds. The project also identified the types of pollutants associated with urban land use activities and the types of BMPs that need to be implemented in East Baton Rouge Parish (EBRP).

Within the first year, the Louisiana State University project manager established four teams organized around four main activities: Geographic Information System (GIS) database development and analysis, field data collection and analysis, hydrologic modeling, and education and communication.

The goals that have been accomplished were developed by the following series of more specific objectives: (1) analyzing spatial patterns of urban land use, land cover and runoff; (2) identifying and evaluate specific BMPs applicable to EBRP; (3) developing and evaluating functional assessment protocols for water quality functions of urban wetlands; (4) providing technical support to EBRP for ordinances or amendments to existing regulations in EBRP; and (5) developing educational materials to inform governmental, private contractors and the public about BMPs.

The Wetland Steering Committee was established by EBRP during Year One and met frequently during Year Two. The mission of the Wetlands Steering Committee was “to support the efforts of the EBRP Wetlands Program by promoting community understanding and awareness, and facilitating resources to mitigate nonpoint source pollution for the purpose of improving wetlands conditions and functionality in EBRP.” This committee is made up of 10 official members, including representatives of city-parish, state and federal resource agencies, nongovernmental organizations and the developer/builder community. During 2007, a series of education workshops were held for the public and decision makers in EBRP to inform them about TMDLs, watershed planning and urban nonpoint source pollutants. The workshops were well attended and EBRP Planning Commission was successful in proposing changes to the Unified Development Code that would require water quality plans and urban BMPs for all developments in the parish. The changes were passed by the Metro Council in Baton Rouge in December 2007.

# Implementation and Improvement

## Mandeville Neighborhoods

This project ended in 2007 and the Final Report is in review at DEQ. As Mandeville has grown, residential development has increased, which has resulted in a decline in the quality of the natural environment and an increase in environmental pollution. This is presenting a challenge for residents who were originally drawn to Mandeville because of the extensive green spaces and the unpolluted environment.



This project, which was completed in September 2007, constructed a neighborhood park to demonstrate how green space can be used to manage urban storm water runoff. The goal of this project was to increase environmental education and outreach regarding urban NPS pollution in an effort to increase environmental awareness and implementation of

storm water management practices. The project site demonstrates several different types of “wetland theme gardens”, which emphasizes a naturalized approach for mitigating storm water that is cost effective and complimentary to the landscape. The Mandeville Neighborhoods site provides local residents opportunities for passive recreation and nature watching opportunities, biking, and environmental education.

A website was created to explain to the public that well designed urban natural areas within residential subdivision can be used to filter and clean stormwater prior to its release into freshwater bayous and eventually to lakes. The website address is:

<http://www.comiteresources.net/mandeville%20NW/mandindex.htm#>

Due to time constraints, monitoring after construction was not completed. Even though the project is complete, post-construction monitoring will continue and will be compared to pre-construction data to confirm that NPS pollution is reduced.

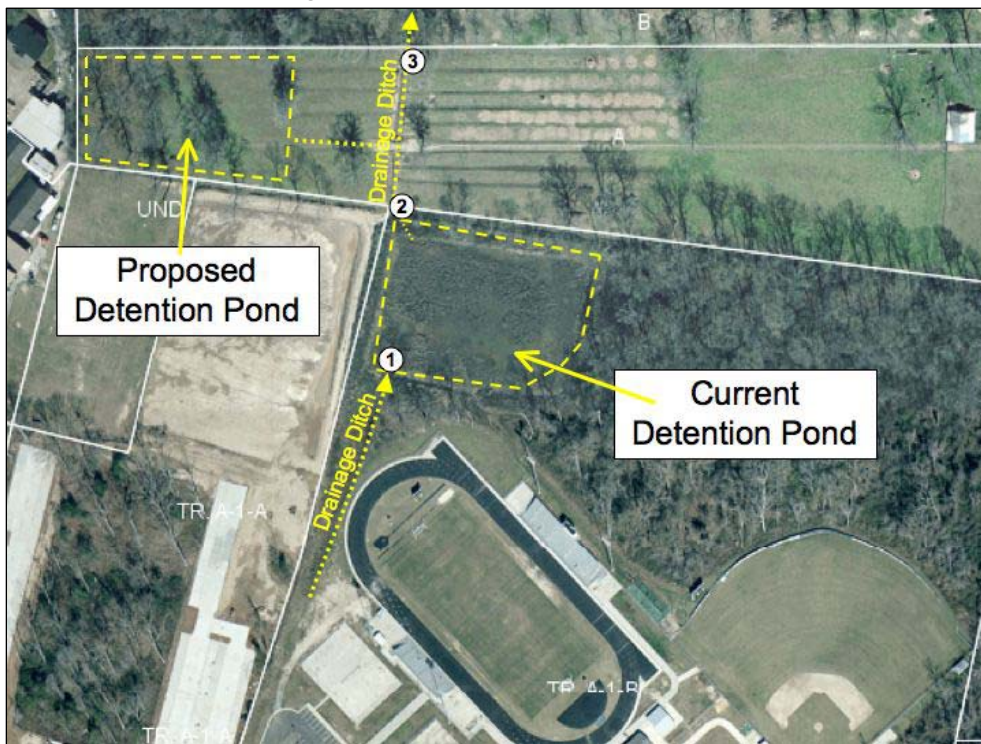


# Implementation and Improvement

## **Storm Water BMPs in Wetland Landscape Design Planning, Construction**

This project at Woodlawn High School (WHS) continued in 2007 and is scheduled to be completed in 2009. In this project, Best Management Practices will be implemented for creating and enhancing wetlands to order to reduce nonpoint pollution from storm water. It will also determine how wetland systems in East Baton Rouge can help decrease urban runoff into local water bodies. Currently, WHS has a detention pond system that is being used to reduce the volume of storm water runoff from the adjacent school parking lot. This detention pond will be converted into a created wetland not only to reduce the volume of storm water runoff, but also to increase residence time, to uptake and sequester nutrients, and to provide an educational training site for the East Baton Rouge Planning Commission and the East Baton Rouge Parish School System. These improvements will benefit the water quality in the Amite River (sub-segment 040302) in the Pontchartrain Basin.

Woodlawn High School's old detention pond has little ecological function and value for wildlife. In addition, it lacks hydric soil conditions for properly supporting wetland plants. This was a result of no retention of base flow from storm water runoff. These problems can be corrected by creation of a serpentine (meandering) channel in the detention pond and installation of a weir drainage system



at the far end of the detention pond that will maintain a minimum water level within the created wetland system. Storm water runoff from WHS will be rerouted through the new meandering channel, slowing water velocity, increasing water residence time, and decreasing downstream flooding and sediment transport.

## **Wastewater Treatment Plant Assistance in North Shore Watersheds**

This project is currently in progress, and its goal is to meet the remaining conditions on the Louisiana Coastal Nonpoint Pollution Control Program for Urban Existing Onsite Disposal Systems (OSDS). This project will provide assistance to existing OSDS in accordance with the Management Measures listed in the Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters. A survey of post-Katrina land use and wastewater needs in the southern portion of St. Tammany and Tangipahoa Parishes and assistance to the owners of existing OSDS will be performed. Education and outreach will be performed by the subcontractor. Owners

# Implementation and Improvement

of existing OSDS will receive material on the correct operation and maintenance of their system. An emphasis will be placed on small home units.

## **St. Tammany Parish Tchefuncte and Bogue Falaya Watershed Implementation Project**

This project was completed in 2007 and the Final Report is in review at DEQ. The goals of the project were to characterize land use, natural resources, water quality, and physical conditions through stream assessments and other field activities; assess future conditions with a suite of

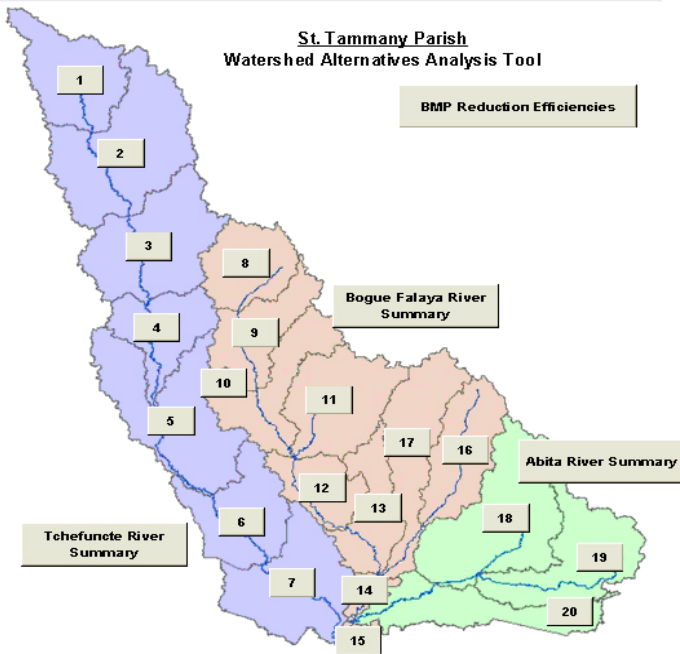
computer models for hydrology, hydraulics, and water quality; identify and rank problems within the watershed; recommend potential improvement and restoration projects; and develop a GPS/GIS Watershed Management Tool to aid the Parish in managing the watershed.

The watershed characterizations, models and watershed management tool that have been developed provide significant opportunities for planning, protection and restoration of water bodies in St. Tammany Parish. This comprehensive work provided critical information on the water quantity and quality, land use, runoff loadings, dischargers, water body impairments and impacts of pollutant loadings that

are currently entering the receiving streams. The Tchefuncte River and Bogue Falaya Watershed Models and the Watershed Management Tool can be utilized by the Parish to: Fix past mistakes and maintenance problems, solve chronic flooding problems, facilitate storm water demonstration and education, reduce runoff frequency and size of sewage overflows in sub-watersheds, reduce loadings of pollutants of concern, reduce downstream channel erosion, provide hydrologic controls to support stream restoration, easily define the retrofit storage volume needed at both the site and sub-watershed scale and setting water quality and reduction volume targets, and setting channel protection volume targets to accommodate extended detention for the runoff generated by the 1-year 24-hour design storm.

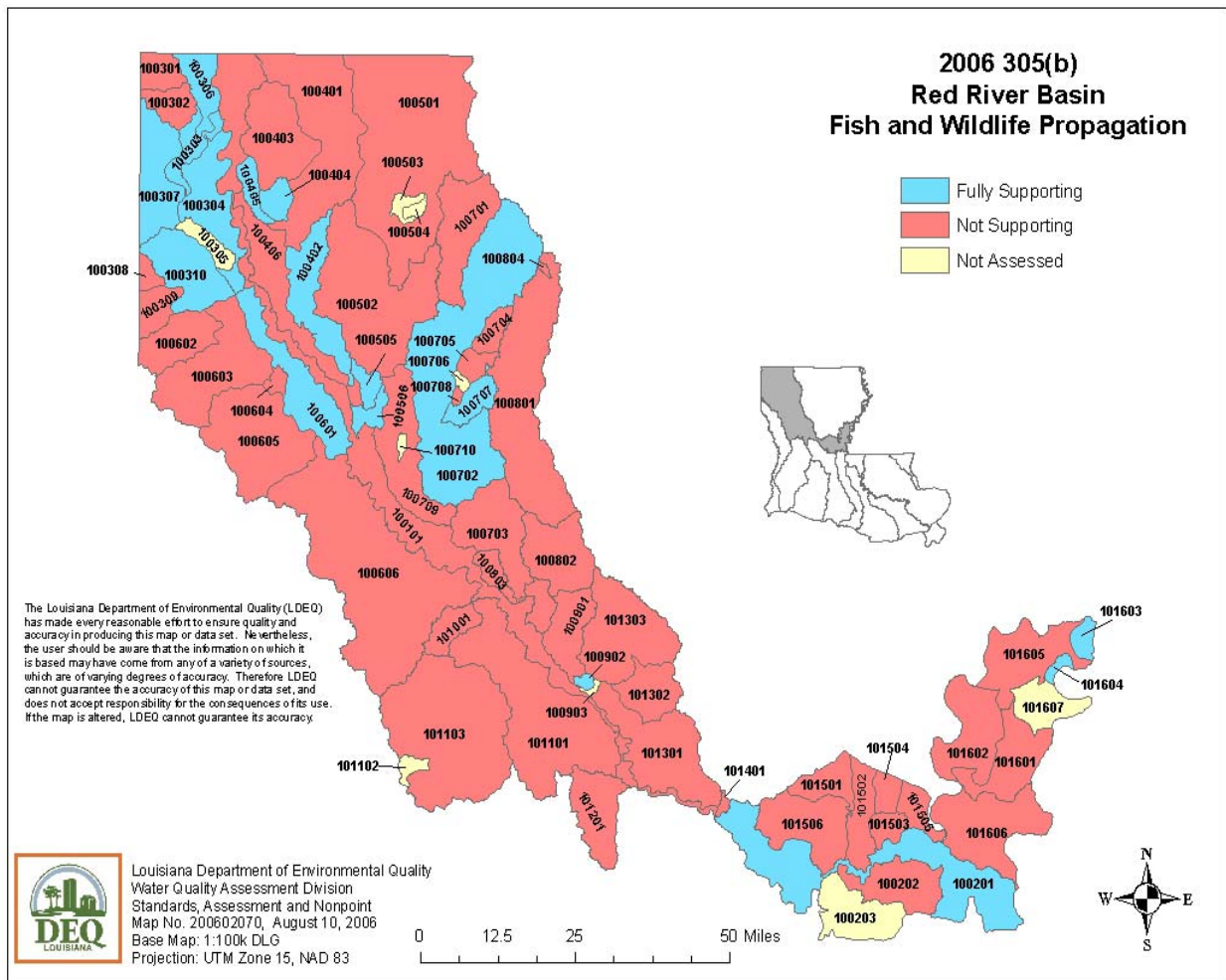
### **USDA Programs**

During 2007, the USDA implemented approximately 11,081 acres of BMPs within the Pontchartrain Basin through the EQIP. An additional 2,020 acres of practices were implemented through the Conservation Reserve Program (CRP), 398 acres of practices were implemented through the Grasslands Reserve Program (GRP), and 933 acres of practices were implemented through the WHIP.





## Red River Basin



The Red River Basin is located in the northwestern portion of the state and consists of forests, row-crop agriculture, pastures and urban areas. The Red River Basin has a substantial number of water bodies not fully meeting its uses. All of the field work for TMDLs and the detailed level crop analysis have been completed. The TMDLs for the impaired water bodies were completed in 2007 and watershed plans will be developed for those watersheds by 2010.

The 2006 Integrated Report indicated that dissolved oxygen and mercury were the primary reasons for the fish and wildlife propagation use not being met. Of the 50 water quality sub-segments, 34 were not meeting the fish and wildlife propagation use. There are a wide range of causes for these impairments, including: municipal point sources, package treatment plants, small flows, residential areas, irrigated and non-irrigated crop production and natural conditions.

LDEQ has already implemented several projects within these watersheds to address the types of nonpoint source pollutant problems that exist there. Most of these data shows a trend of improving

# Implementation and Improvement

dissolved oxygen concentrations in the Flat River since 1995, but have starting decreasing since 1998.

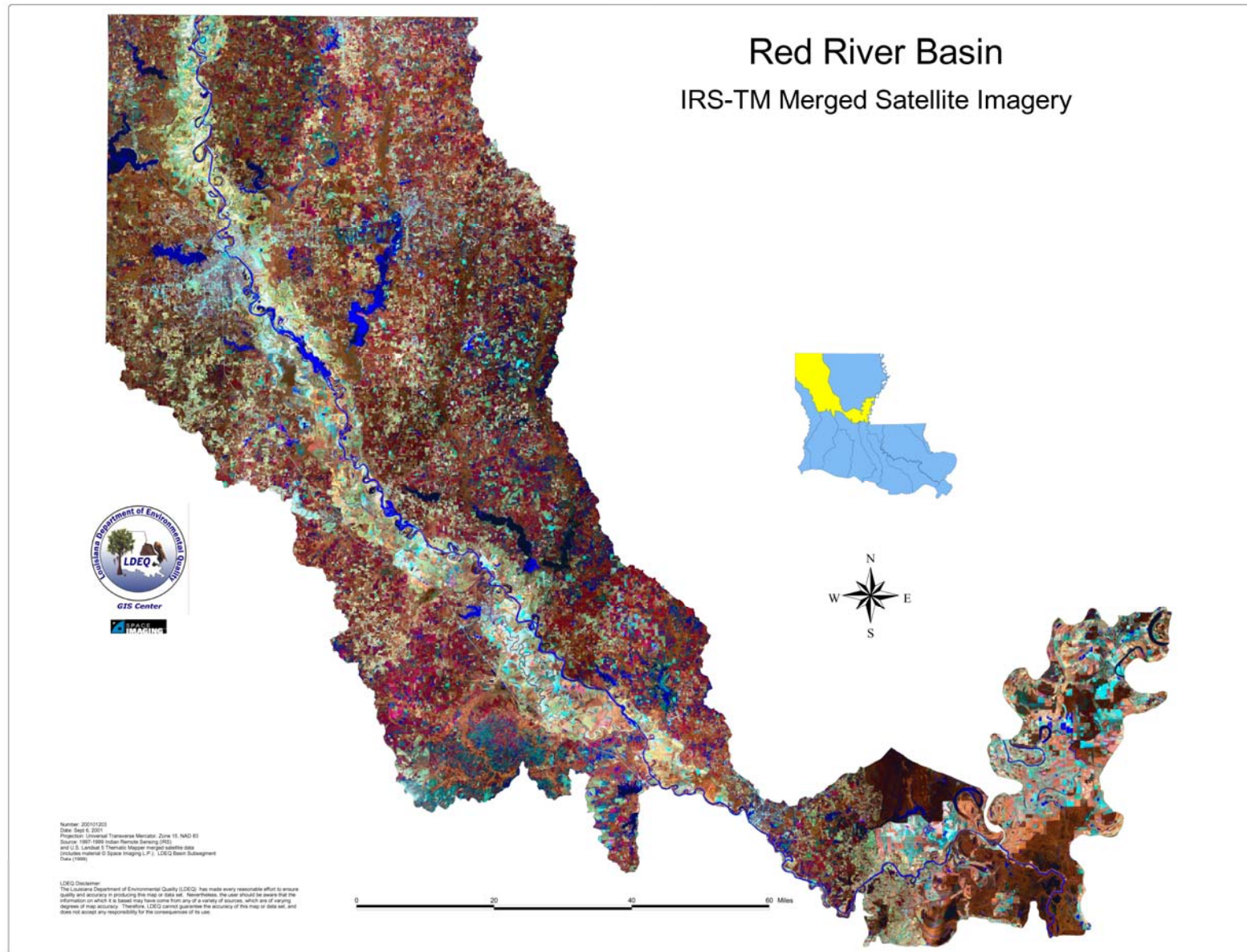
Average Dissolved Oxygen Concentrations Measured in mg/L for Selected Water Bodies in the Red River Basin								
Water Body (sub-segment)	1995	1996	1997	1998	2002	2005	2006	2007*
Flat River (100406)	5.01	6.11	7.63	8.68	5.45	no data	no data	4.29
Kepler Creek (100704)	4.57	3.95	5.45	6.51	3.49	no data	3.24	no data
Saline Bayou (100801)	7.05	6.11	5.99	7.02	5.89	7.11	5.69	no data
*partial year data in 2007								

The fecal coliform data indicated a wide range of values that fluctuated with rain fall events. The concentration of fecal coliform in the Flat River has increased from 1995 to 2002, except for 1998 which was a drought year.

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for Selected Water Bodies in the Red River Basin								
Water Body (sub-segment)	1995	1996	1997	1998	2002	2005	2006	2007*
Flat River (100406)	116	264	1831	60	456	no data	no data	374
Kepler Creek (100704)	86	48	46	174	261	no data	123	no data
Saline Bayou (100801)	333	99	381	123	245	141	273	no data
*partial year data in 2007								



# Implementation and Improvement





# *Implementation and Improvement*

## **Water Quality and Crop Production Response to the Use of BMPs and Poultry Litter, Phase 2**

This project ended in 2007 and the Final Report is in review at EPA. Large quantities of organic wastes generated by the poultry industry have been recognized as a potential source of nutrients and organic matter for crop production. This is an attractive source of nutrients because it provides an avenue for the disposal of poultry litter and would increase the soil organic matter content over time. When combined with conservation tillage, the application of poultry litter to cotton fields may reduce the rate of sediment runoff to water bodies even further. The largest area of poultry production in Louisiana is in the north central part of the state and is expanding into the Red River parishes. Information generated from using organic waste with a BMP will provide a feasible method of disposal for poultry litter while improving water quality.

In Phase I of this project, a three-year project to demonstrate the use of poultry litter as a source of nutrients and a best management practice (conservation tillage) for cotton production was conducted at the Red River Research Station, Bossier City, LA. In addition to collecting agronomic data, water samples were collected at the edge of the field and as leachate, to determine the effect of poultry litter and a best management practice on water quality.



Automatic samplers collect runoff from 12-row conventional and conservation tillage cotton plots.

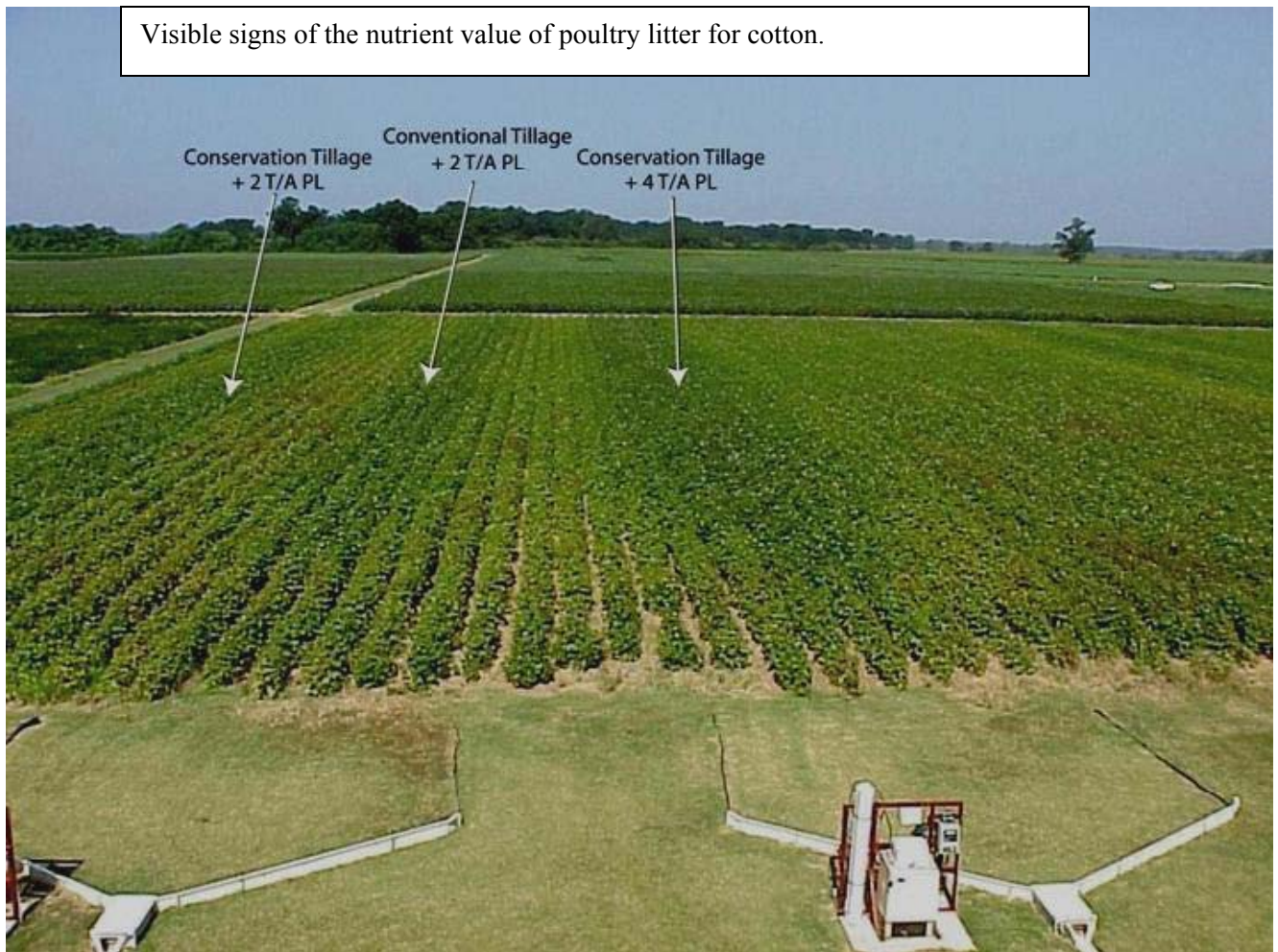
Phase II of this demonstration project was conducted in the same location as Phase I on a Red River alluvial soil on which poultry litter has been applied as a fertilizer source to cotton grown with conservation and conventional tillage practices. Information gathered from this project will be disseminated in educational programs about the benefits of these alternative management practices. Expected benefits of the demonstration and educational program include farmer adoption of alternative methods for the disposal of poultry litter as an inexpensive source of

# *Implementation and Improvement*

fertilizer. This should result in improved soil tilth, reduced erosion, and reduced nutrient and pesticide runoff loss.

Results from this project to date indicate that poultry litter can be used successfully in cotton production to improve soil fertility with acceptable impact on water quality. Poultry litter not only increased phosphorous, potassium, and copper content of the soil, but also significantly improved organic matter content which ultimately improves water holding and buffering capacity. Yield of cotton was not significantly influenced by poultry litter in this project, but results from Phase I indicated significant cotton yield improvement with the combination of 2 tons of poultry litter per acre and conservation tillage practices.

This project was presented at the Red River Research Station Field Day on September 14, 2006 and at the Natchitoches Agricultural Day on March 24, 2007. Both events were attended by area-wide producers, state and federal agency representatives and the general public.





# Implementation and Improvement

## Constructed Wetlands to Improve Water Quality for Whole-Farm Operations

This project was completed in June 2006, and the Final Report is currently in review at EPA. Over 25,000 acres of agricultural crop land and 29,000 acres of pasture land reside within the LDEQ's water quality sub-segments 100402 and 100406. The Flat River and Red Chute Bayous drain these sub-segments and, based on the 2000 Water Quality Inventory 305(b) Report; these two water bodies only partially met their designated uses. The Flat River/Red Chute Bayou watershed is on the 1999 court-ordered 303(d) list of impaired waters in Louisiana. The primary suspected causes of this impairment are organic enrichment, low dissolved oxygen, nutrients, pesticides, suspended solids, siltation, and pathogen indicators resulting from non-irrigated crop production. LDEQ is currently developing total maximum daily loads (TMDLs) for this watershed.

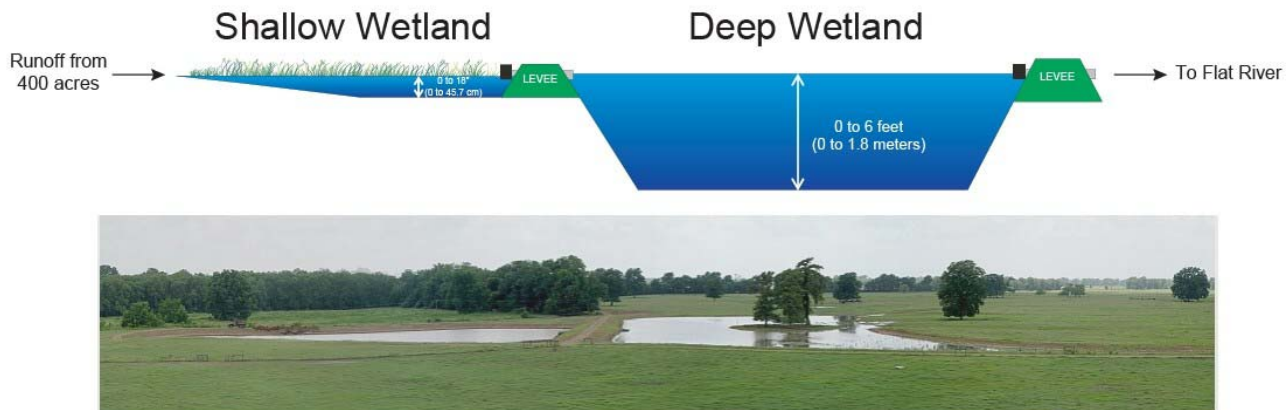


Diagram of the Cross Section of the planned wetland, and Photo of the actual Constructed Wetland

Although agricultural practices such as conservation tillage help reduce nonpoint source discharges, they are only partially effective. However, limited information indicates that constructed wetlands have been used successfully for the treatment of nonpoint discharges from agricultural sources, removing 90 percent of total phosphorus and suspended solids, 80 percent of chlorpyrifos and metolachlor, and 50 percent of atrazine (DuPoldt et al., 1993 and M. T. Moore, 1999). Constructed wetlands remove sediment through physical means and pesticides and fertilizer through biological means provided by plants and microorganisms.



The LSU AgCenter's Red River Research Station consists of 573 acres of agricultural land located in the Red River Basin within sub-segment 100406. Much of the Red River Research Station's land area is subdivided into 4-to-8 acre blocks where various crops are grown. The crops grown include cotton, soybean, corn, grain sorghum, and wheat. All blocks are maintained according to Louisiana State



# Implementation and Improvement

University Cooperative Extension Service guidelines with practices similar to those used on conventional arable land in the area. Runoff water from the station drains into the Flat River which is located less than one-third mile away. As mentioned previously, the Flat River is on the 303(d) list of impaired water bodies in Louisiana.

Approximately 400 acres of discharge water from the station flows to the southeastern corner where it enters Lay's Bayou, then Flat River. The southeast corner of the station was therefore identified as an ideal location to construct a wetland to demonstrate the potential for improving the water quality of discharge from agricultural lands prior to drainage into state water bodies.



School children visiting constructed wetland

Results from this project have shown that a constructed wetland system can be beneficial in improving the water quality of runoff from agricultural land. The system significantly lowered phosphates, total phosphorus, total Kjeldahl nitrogen, total suspended solids, and slightly increased dissolved oxygen content. Nitrates also were lower in the deep wetland grab

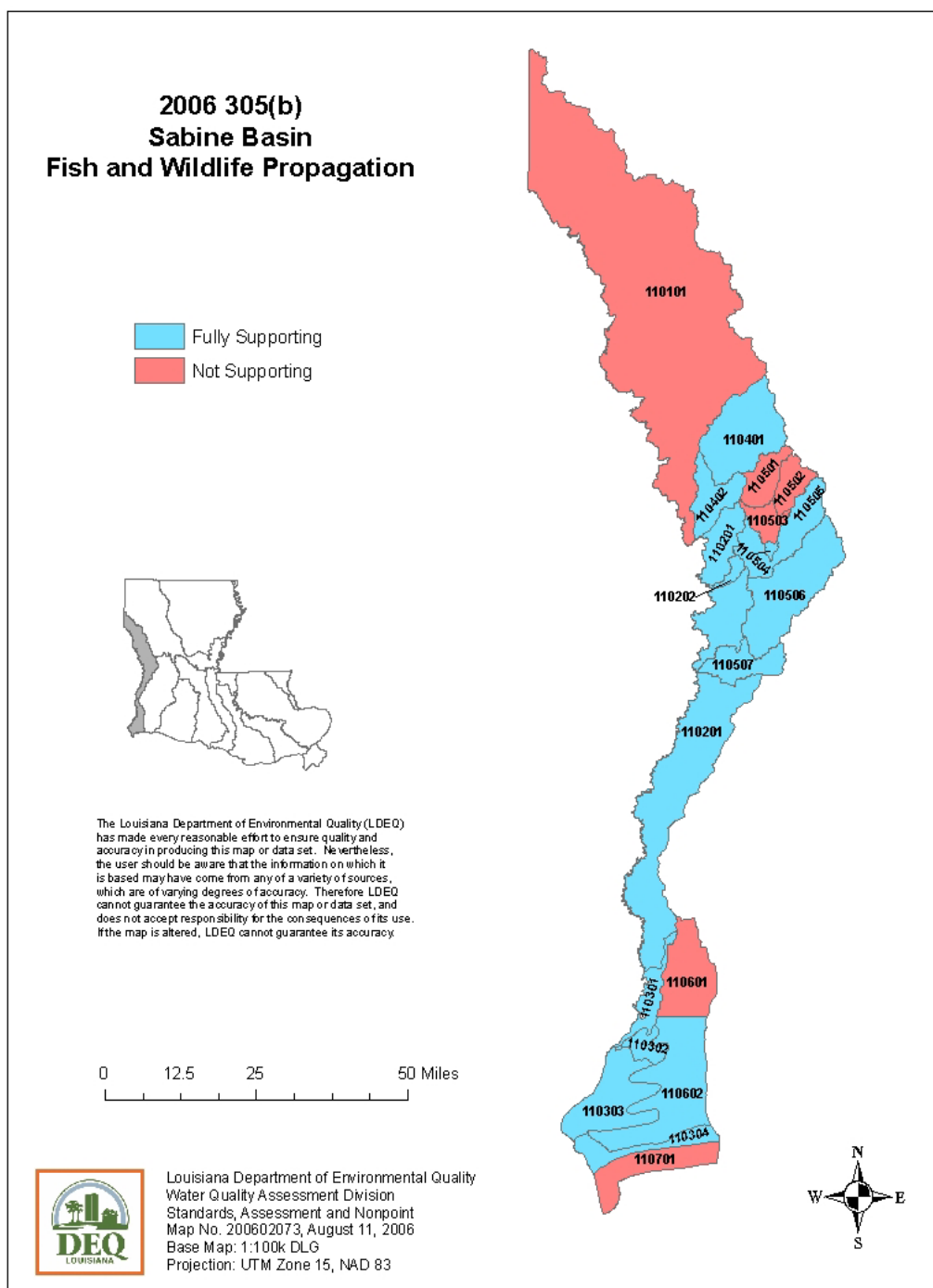
samples in contrast to runoff samples, indicating the importance of anaerobic conditions for reduction. The herbicides atrazine and metolachlor significantly increased in concentration by the time runoff water reached the deep wetland, the final phase of the system. These pesticides may have been bound to soil particles that were filtered as part of the laboratory procedure for their measurement. Since the deep wetland samples were lowest in suspended solids, the opportunity for these pesticides to bind to soil particles was not as prevalent as in the other stages of the system. This hypothesis could easily be tested by running pesticide analyses on the filtered soil particles.

## USDA Programs

During 2007, the USDA implemented approximately 30,759 acres of BMPs within the Red River Basin through the EQIP. An additional 2,562 acres of practices were implemented through the CRP, 47 acres of practices were implemented through the GRP, 4,494 acres of practices were implemented through the WRP, and 499 acres of practices were implemented through the WHIP.

# Implementation and Improvement

## Sabine River Basin



The Sabine River Basin lies along the Texas-Louisiana border, encompassing more than 2,900 square miles of drainage area. The basin extends from Texas state line near Shreveport to the Gulf of Mexico. The land-use within the Sabine Basin ranges from forests and pastures in the north to brackish and saline marshes in the south. Of the 19 water quality management sub-segments in the Sabine River, six were not meeting the fish and wildlife propagation use. The primary causes of

# Implementation and Improvement

impairment were associated with mercury and a few with turbidity and low dissolved oxygen. There are four watersheds that are not fully meeting the contact recreation use because of fecal coliform concentrations. Water quality surveys and TMDLs were completed for each of the impaired water bodies within the Sabine River Basin by March 2008, and watershed plans will be developed for each of the water bodies that have TMDLs developed for them. The schedule for completion of these watershed plans is 2010.

LDEQ has implemented several projects within the Sabine River Basin in the past; however, the LDEQ did not implement any NPS projects within this Basin during 2007. The water quality data for the Sabine River indicates that both dissolved oxygen and the fecal coliform are fully meeting water quality standards.

Average Dissolved Oxygen Concentrations Measured in mg/L for Selected Water Bodies in the Sabine River Basin								
Water Body (sub-segment)	1995	1996	1997	1998	2002	2005	2006	2007*
Sabine River (110301)	6.57	7.8	6.03	6.76	7.05	no data	6.57	no data
*partial year data in 2007								

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for Selected Water Bodies in the Sabine River Basin								
Water Body (sub-segment)	1995	1996	1997	1998	2002	2005	2006	2007*
Sabine River (110301)	235	140	323	53	165	no data	84	no data
*partial year data in 2007								

## USDA Programs

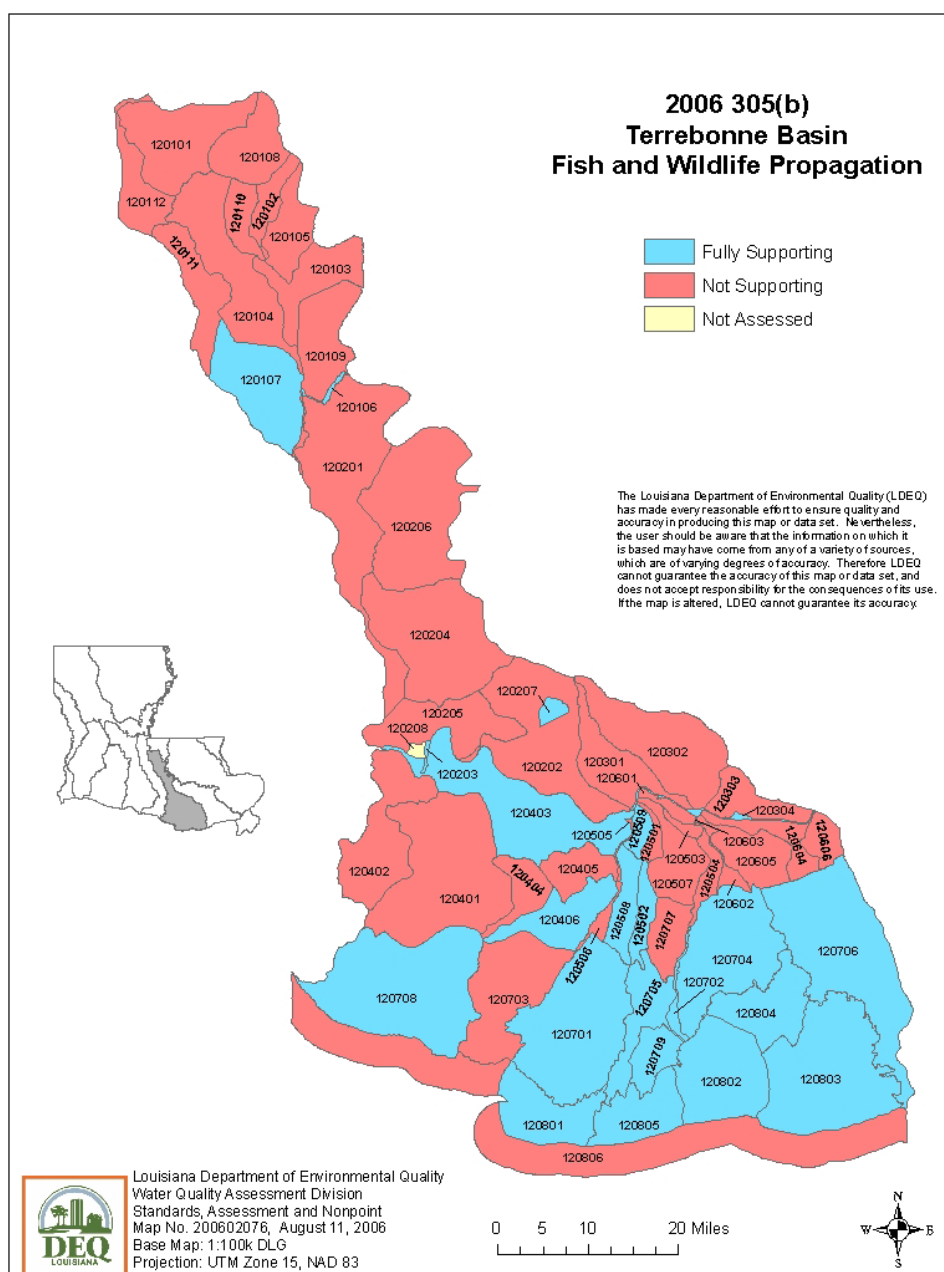
During 2007, the USDA implemented approximately 4,778 acres of BMPs within the Sabine River Basin through the EQIP. An additional 71 acres of practices were implemented through the CRP, and 595 acres of practices were implemented through the WHIP.





# Implementation and Improvement

## Terrebonne Basin



The Terrebonne Basin covers an area extending approximately 120 miles from the Mississippi River to the Gulf of Mexico on the south. The land-use within the northern part of the Basin consists primarily of agriculture and forests. In the south it is primarily marshes, ranging from fresh water to saline. The Basin comprises of 60 water quality sub-segments, 38 of which do not meet the fish and wildlife propagation use. The primary problems are low dissolved oxygen and elevated turbidity. EPA and LDEQ are working on a Use Attainability Analysis (UAA) for the Terrebonne Basin to determine what the appropriate water quality criteria should be for dissolved oxygen.

# Implementation and Improvement

Through the UAA process, the chemical and biological data are examined to determine if the use is being met.

During 2004, water quality surveys were conducted for the impaired water bodies within the Terrebonne Basin and eight TMDLs will be completed by March 2008. Detailed satellite imagery classification of the crop types was completed for the entire Terrebonne Basin. Draft watershed plans were completed for the impaired water bodies within this basin during 2007.

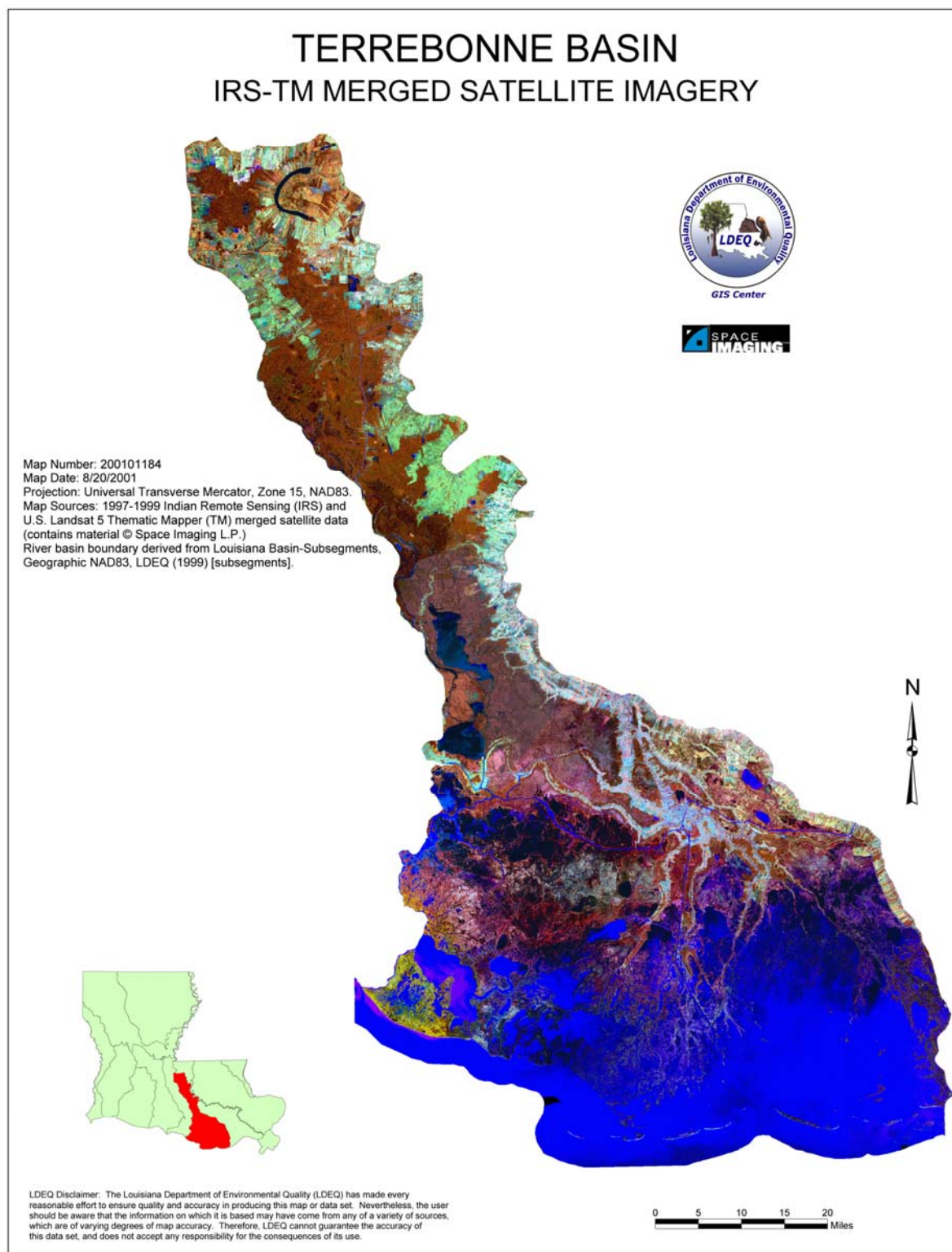
Data was collected in this basin in 2000, 2004 and 2005. Water quality data will be collected again during 2008 to determine whether the watershed projects that have been implemented have resulted in reductions of nonpoint source pollutants and improvements in water quality.

Average Dissolved Oxygen Concentrations Measured in mg/L for Selected Water Bodies in the Terrebonne Basin					
Water Body (sub-segment)	2000	2004	2005	2006	2007*
Bayou Point aux Chene (120605)	3.77	no data	5.23	4.68	no data
Bayou Grand Caillou (120501 and 120502)	5.48	no data	4.62	no data	4.55
Bayou Petit Caillou (120503 and 120504)	5.47	no data	5.11	no data	5.41
*partial year data in 2007					

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for Selected Water Bodies in the Terrebonne Basin					
Water Body (sub-segment)	2000	2004	2005	2006	2007*
Bayou Point aux Chene (120605)	429	no data	65	110	no data
Bayou Grand Caillou (120501 and 120502)	235	no data	122	no data	780
Bayou Petit Caillou (120503 and 120504)	220	no data	218	no data	186
*partial year data in 2007					



# Implementation and Improvement

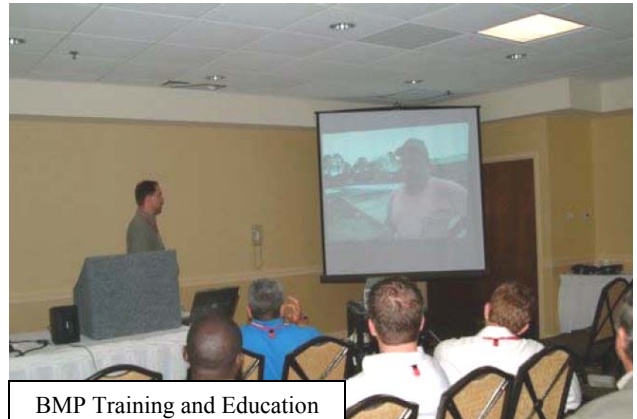




# Implementation and Improvement

## Urban BMP Training for Construction Runoff and Home Sewage Education Awareness

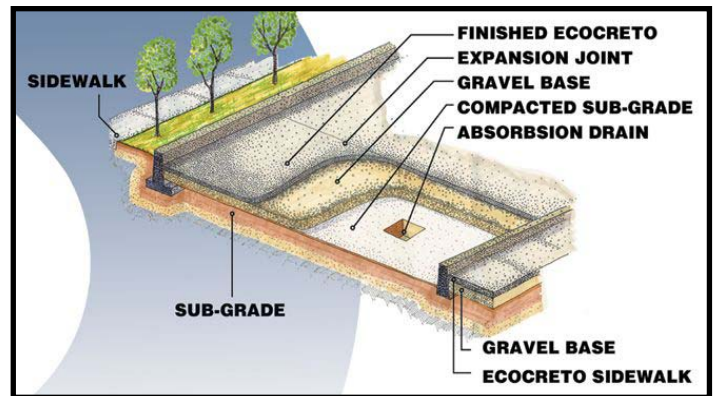
This project ended in 2007 and was implemented by the South Central Planning and Development Commission (SCPDC), which covered most of the Barataria and Terrebonne Basins. The goal of this project was to implement an educational program, complete with accompanying video. The SCPDC invited 100% of Parish public works employees, builders, contractors, and engineers within the region through flyers and direct invitation to the construction runoff workshops. The workshop showed steps that can greatly reduce or eliminate sediment runoff from job sites.



BMP Training and Education

The SCPDC installed construction BMPs at the new SCPDC building site. The efforts were filmed and a professional video was produced focusing on construction BMPs. The SCPDC installed a pervious parking lot material to the new administrative facility while under construction. Pervious surfaces reduces the runoff by >50% and retains many of the pollutants in the matrix where natural microbes break down parking lot constituents such as oil and grease over time.

An educational awareness program was also implemented to help inform local citizens and parish officials on sewerage pollution problems in Bayou Lafourche, the law and regulations regarding home sewerage systems, septic tanks etc., where they drain to, and how to maintain these systems. A “door-to-door hanger” campaign reached residents along Bayou Lafourche where the highest concentration of home/camp owners are reflected on the GIS mapping tool provided by SCPDC to LDEQ.



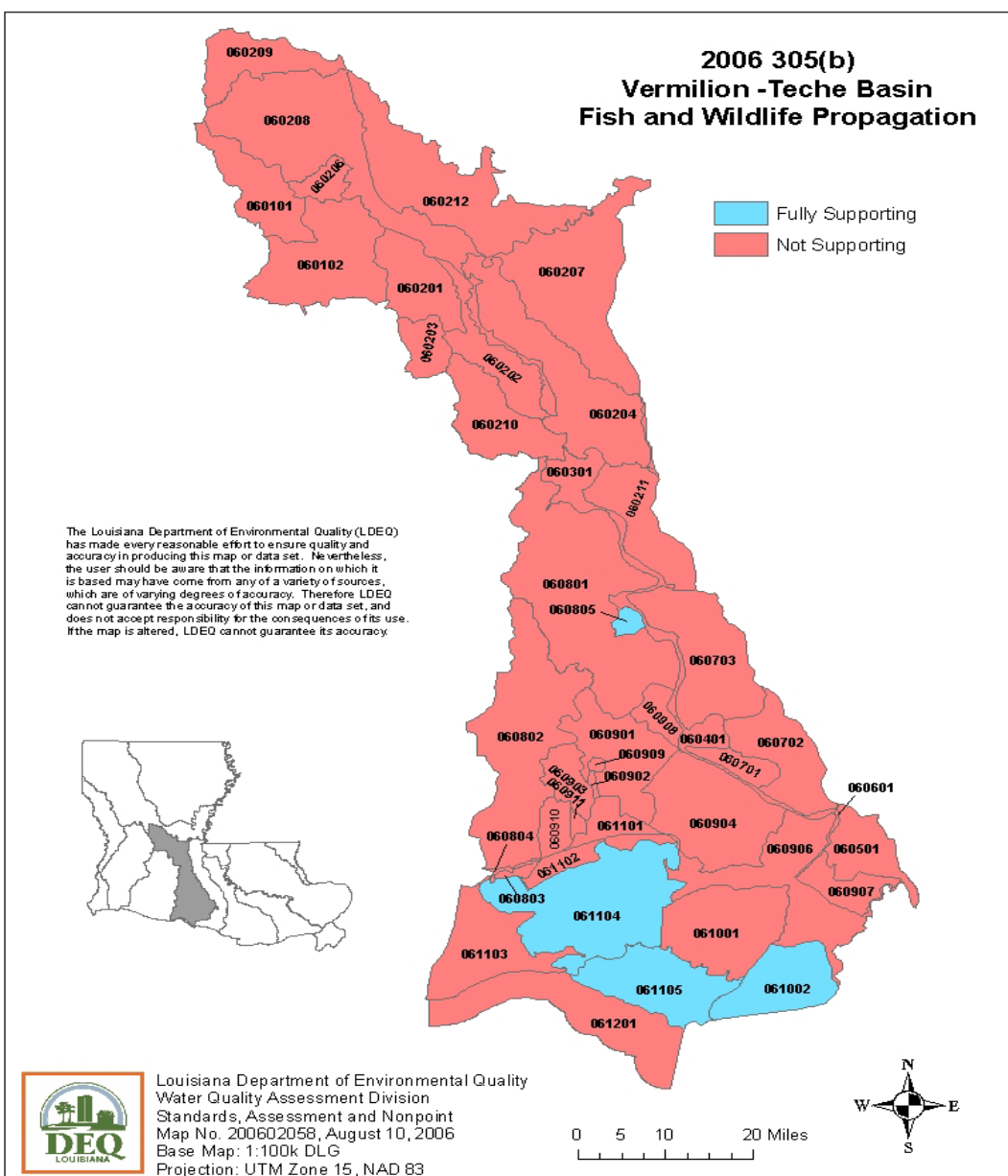
The SCPDC coordinated the ongoing partnership efforts of local, state and federal agencies, organizations and homeowners regarding construction runoff and home sewerage systems. This included agencies such as: LDHH, LDEQ, BTNEP, the Bayou Industrial Group, the Rotary and Kiwanis clubs, the gardening clubs, and homeowners associations.

### USDA Programs

During 2007, the USDA implemented approximately 16,014 acres of BMPs within the Terrebonne Basin through the EQIP. An additional 223 acres of practices were implemented through the WHIP.

# Implementation and Improvement

## Vermilion-Teche River Basin



The Vermilion-Teche River Basin is comprised of the Vermilion River and Bayou Teche, which flow through south central Louisiana. The Basin is bordered on the east by the Atchafalaya River Basin and on the west by the Calcasieu River Basin. The majority of the land-use within the Vermilion-Teche Basin is agricultural land, primarily rice, crawfish, soybeans, sugarcane and pastures. The Basin is comprised of 44 watersheds, 25 of which do not fully meet the designated use for fish and wildlife propagation. Similar to the Mermentau River Basin, the problems are primarily associated with failure to meet the water quality standard for dissolved oxygen.

# Implementation and Improvement

During 1998, water quality surveys were conducted for these water bodies and during 2000 through 2003, TMDLs were developed for six watersheds: Bayou Teche, Bayou Boeuf, Vermilion River, Bayou Cocodrie/Lake Chicot System, Lake Fausse Point/Dauterive Lake, and Bayou Courtableau. The NPS Unit developed watershed plans for the Vermilion River, Bayou Teche, and Bayou Cocodrie.

LDEQ continued to focus resources and time within the Vermilion-Teche River Basin during 2007, and collected water quality data during 2006 and 2007 to determine whether water quality was improving as a result of these activities. Water quality data will be collected again during 2008 to determine whether the watershed projects that have been implemented have resulted in reductions of nonpoint source pollutants and improvements in water quality.

Average Dissolved Oxygen Concentrations Measured in mg/L for Selected Water Bodies in the Vermilion-Teche River Basin						
Water Body (sub-segment)	1998	2003	2004	2005	2006	2007*
Vermilion River (060802)	5.27	4.31	4.03	4.83	4.98	3.65
Bayou Teche (060401)	5.24	4.10	4.70	4.89	4.51	4.41
Bayou Petite Anse (060901)	3.86	3.17	no data	no data	3.63	no data
Bayou des Glaises (060212)	4.42	no data	no data	4.30	4.77	no data
*partial year data in 2007						

The water quality data for the Vermilion River and Bayou Teche indicates that average dissolved oxygen concentrations have fluctuated since 1998, but the most recent data shows the concentration is not as high as it was in 1998. The water quality data for Bayou Petite Anse and Bayou des Glaises indicates that the average dissolved oxygen concentration has increased in the most recent years.

Average Fecal Coliform Concentrations Measured in Cells per 100 mL Sample for Selected Water Bodies in the Vermilion-Teche River Basin						
Water Body (sub-segment)	1998	2003	2004	2005	2006	2007*
Vermilion River (060802)	1860	1412	2861	239	137	166
Bayou Teche (060401)	2194	943	480	439	152	120
Bayou Petite Anse (060901)	2221	880	no data	no data	158	no data
Bayou des Glaises (060212)	413	290	no data	no data	192	no data
*partial year data in 2007						

The water quality data for fecal coliform indicates the level of fecal coliform is steadily decreasing since 1998.

## USDA and SWCD Programs

During 2007, the USDA implemented approximately 21,082 acres of BMPs within the Vermilion-Teche River Basin through the EQIP. An additional 1,278 acres of practices were implemented through the CRP, 66 acres of practices were implemented through the CSP, 33 acres of practices were implemented through the GRP, 1,855 acres of practices were implemented through the WRP, and 223 acres of practices were implemented through the WHIP.

The Soil and Water Conservation District utilized Incremental 319 funds in the Vermilion-Teche River Basin. These funds resulted in 50,210 acres of BMPs being implemented on agricultural lands.



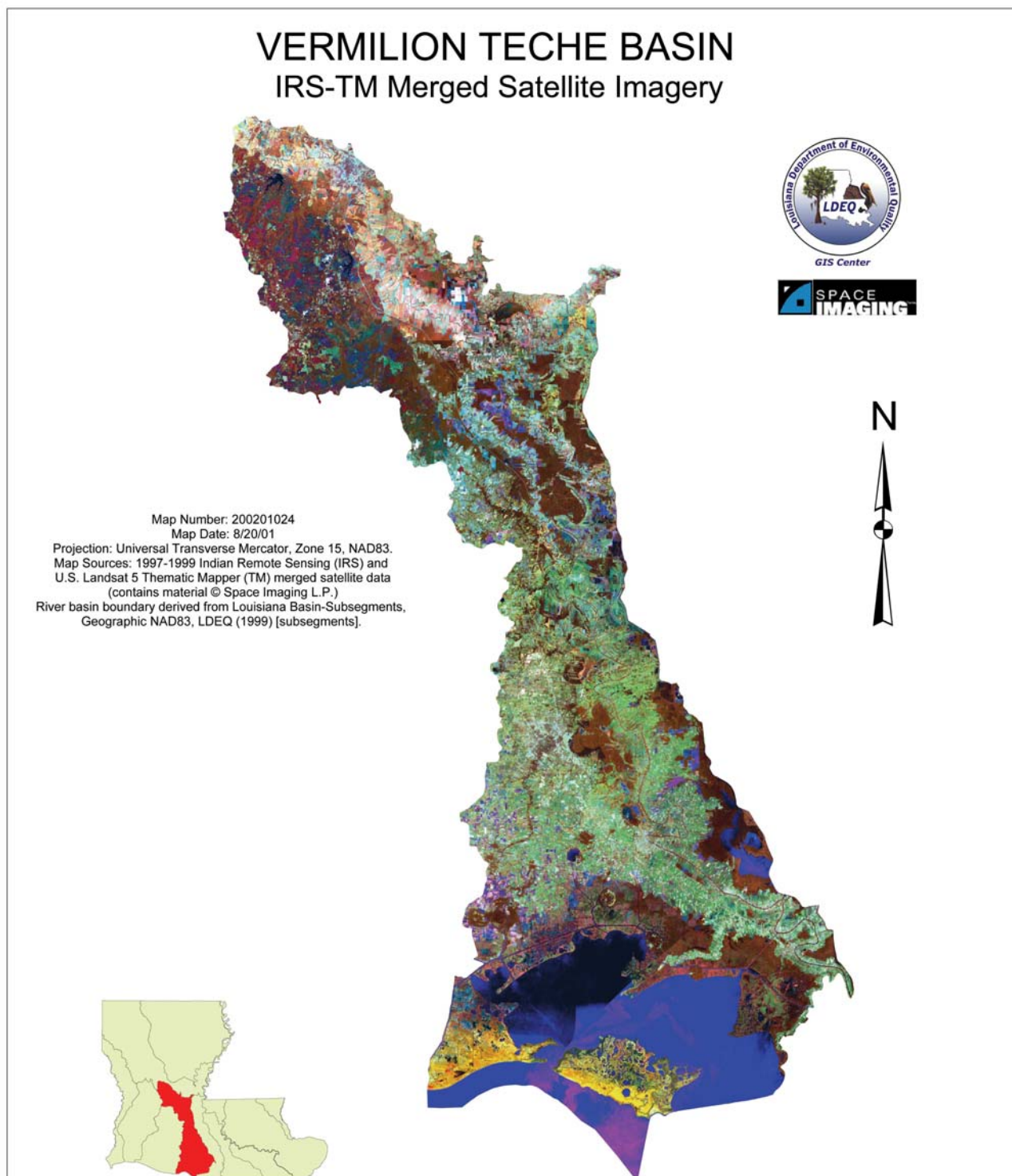
# Implementation and Improvement

In addition to the work that LDEQ funded in the Vermilion-Teche River Basin, the Office of Soil and Water Conservation utilized incremental funds to implement agricultural BMPs within this river basin. The map and table provide details on the type and number of acres implemented through these incremental Section 319 funds.

BMP	Unit Type	Number
Brush Management	acres	62.7
Conservation Crop Rotation	acres	8,341.1
Residue Management	acres	3,545.9
Fence	feet	7,657
Managed Field Borders	feet	183,373
Grade Stabilization Structure	each	3
Irrigation Water Management	acres	2,740.4
Irrigation Land Leveling	acres	1,316.5
Prescribed Grazing	acres	566.6
Nutrient Management	acres	7,618.1
Pest Management	acres	7,618.1
Shallow Water for Wildlife	acres	3,125.9
Record Keeping	acres	7,618.1



# Implementation and Improvement



# Implementation and Improvement

## Lower Vermilion River Watershed NPS Project

This project was completed in 2007 and the Final Report is in review at DEQ. To accomplish the overall objective of improving water quality, sediment-laden discharges from cropland would be reduced. Another major objective was to demonstrate that water quality could be improved by individual conservation practices. BMPs were developed by the NRCS and the LSU AgCenter using tried and established NRCS conservation practices.

The goal of 50 farms was not achieved. A total of 14 farms were enrolled into the project. Resource Management System (RMS) level plans were written for enrolled acres for all 14 applications. Fourteen (14) RMS plans were implemented. The goal of 50 farms was not met due to Hurricane Rita, proceeding years of drought, low crop prices, high fuel prices, and other factors.

Loss of home, equipment, and/or livestock was so devastating that most farmers in the affected area, those that are still farming, are just now beginning to turn the corner financially. Testing by the LSU AgCenter hopes to show that land that has been out of production due to high sodium levels up to now can be brought back into production. Fields that are idle (where a farmer cannot be found to plant it) are at all-time highs. The years leading up to the beginning of the project negatively affected the farming community with crop prices at near-record lows, input costs (especially fuel and fertilizer) at record highs, subsidies reduced, and profit margins almost non-existent. Many farmers still are not able to prove to their bank that they can cash-flow, and so are not able to farm.



The farmers in this project area have heard and seen what BMPs can do for them and their watershed. They have learned that the cost-effectiveness of having Certified Crop Advisors make fertilizer and pesticide recommendations for their crops. Another project such as this is needed. As stated before, only now are farmers and other landowners recovering from the multiple effects of Hurricane Rita. With the increased cost of fuel, as well as other operating costs, cost-share funding needs to be addressed

in a more aggressive manner and payments need to be streamlined.

The implementation of Resource Management Systems, to protect the existing resources, while allowing the farmer to make a living, is as important now as it ever was. Implementation of RMS plans make a significant reduction in nonpoint source pollution because it targets, with BMPs and conservation planning, management of soil, water, nutrients, and pesticides that are the largest components of nonpoint source pollution in the project area.



# Implementation and Improvement

## Evaluating the Effects of Reduced Cultivation and Elimination of Burning of Combine-Harvest Residue on Soil and Water Quality and Sugarcane Profitability in Louisiana

This project was completed in 2007 and the Final Report is in review at EPA. Specific objectives of the project were to evaluate the effects of four combine-harvest residue management treatments on runoff water quality and sugarcane yields at two sites within the Vermilion-Teche watershed, and to educate the public, scientific community and the sugarcane farmers about the results of the project. Combine-harvest residue BMPs were designed to mitigate the adverse effects of sugarcane



residue through application of stabilized urea plus composted biologicals and shredding of the residue for accelerated decomposition. Edge-of-field collections were made using H-flumes and ISCO samplers instrumented with submerged probe flow modules. Samplers were calibrated to composite 300ml samples at 50 gal/min flow. Analyses were made for TSS, TDS, turbidity, TKN, nitrite and nitrate, chloride, bromide, sulfate, total P and BOD5. Field determinations were made for EC, pH and DO.

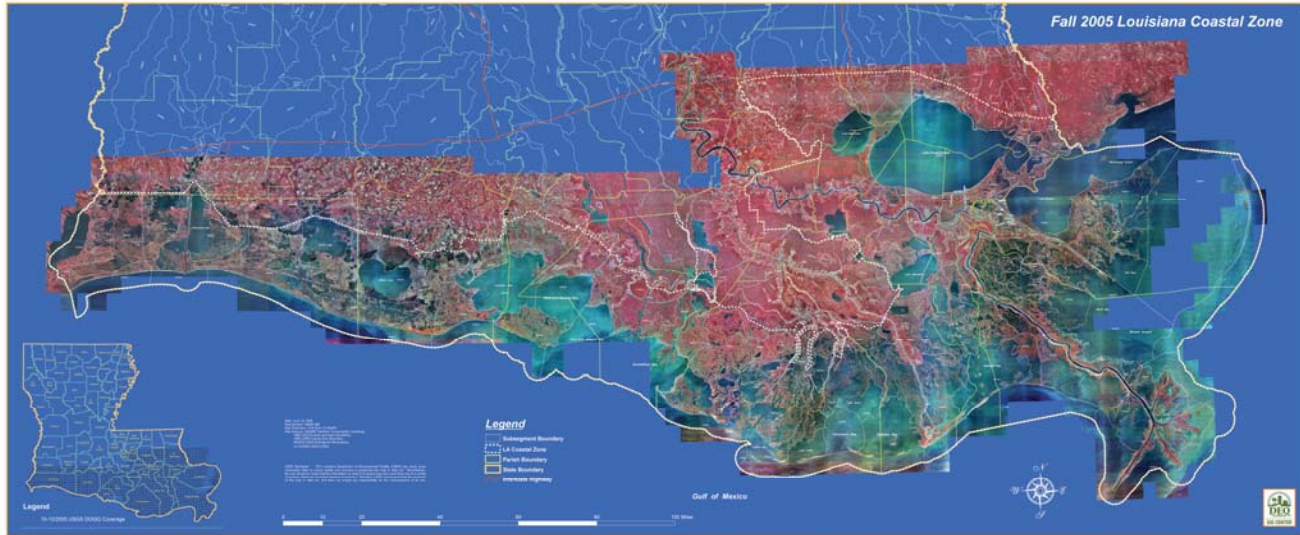
Crop agronomic data included monitoring of crop development and measuring the cane tonnage, sugar yield and nutrient leaf concentration. Rate of disappearance of harvest residue was also measured. Preliminary observations suggest that the treatments designed to enhance residue degradation did not effective the degradation rate of the residue. Sugarcane yields were consistent for all practices. TSS for the residue burned and residue retained plots were 6.65 and 5.08 tons/acre, respectively. TSS was consistently higher for the burned plots until full canopy occurred in late June and July, after which time the treatments were comparable in soil loss. It appears the disparity in tons of soil removed was primarily due to higher soil removal in the burned plots prior



to crop canopy. Nitrate concentrations were considerably higher for the urea/compost treatment. It is clear that the application of stabilized urea (at the high rate of 180 lb N/acre) in the fall is not an environmentally acceptable practice.

# *Implementation and Improvement*

## *Coastal*



The purpose of the Coastal Nonpoint Pollution Control Program (CNPCP) is to reduce pollutants that may impact the coastal waters of Louisiana through identifying, educating, and implementing available Best Management Practices (BMP) for users of Louisiana coastal resources.

The Coastal Management Division of the Louisiana Department of Natural Resources (LDNR) is implementing and developing the CNPCP as a voluntary program based on BMPs. BMPs are technically and economically feasible practices to control and reduce pollutants in our coastal waters. In addition, many BMPs may provide valuable wildlife habitat and can also be an economic benefit to farmers, foresters, marina operators, and many other business operators and individuals.

Coastal nonpoint source pollution is a nationwide problem but has special significance in Louisiana because of the detrimental impact on the valuable coastal fisheries and shellfish industries, as well as causing serious human health concerns.

Activities in 2007 for the CNPCP included three major tasks. The Clean Marina Program, which in the wake of Hurricanes Katrina and Rita took an impact along with the rest of the state, was revived. Educational outreach was continued by the CNPCP staff by attending various events in and around the coastal zone. Managing three Cooperative Endeavors between LDNR and LDEQ began; these projects will use 319 monies with LDNR providing the matching funds and will go towards the final approval of the CNPCP.

The CNPCP's Clean Marina Program held a committee meeting on July 18, 2007 where program status; committee organization and involvement; the status, number, and types of marinas in coastal Louisiana and promotion of the program and certified clean marinas were discussed. On September 05, 2007 the CNPCP staff held a site visit at our existing clean marina, Orleans Marina in New Orleans. Also for the Clean Marina Program outreach, two Clean Marina Program presentations were given; one was on September 11, 2007 for the Baton Rouge Power and Sail



# *Implementation and Improvement*

Squadron, and the other was on October 31, 2007 in Lafayette for the LDEQ Water Quality Conference. By the end of 2007 the CNPCP received two new Clean Marina pledges.

The CNPCP participated in eight educational outreach events in 2007:

- On April 26, 2007 La Branch Wetlands Day in La Branch; an event that involves high school students and elementary school students, where presenters instruct and help high school students present their displays to elementary school students;
- On May 31, 2007 a Water Quality workshop in Gramercy; a workshop for St. James Parish public works employees on the causes and effects of non-point source water pollution;
- On June 15, 2007 gave a presentation at a Project Wet workshop in Darrow;
- On September 27, 2007 AG Day in Gramercy; an event held at the “Fast Food Farm” designed to give students a better understanding of where fast foods come from;
- On September 29, 2007 La Fete d’Ecologie in Thibodaux; which was the 11<sup>th</sup> annual festival celebrating the ecology, people, culture and history of the Barataria-Terrebonne National Estuary; it was CNPCP’s second consecutive year attending;
- On October 25, 2007 Ocean Commotion in Baton Rouge; this event is designed for students to get involved and develop a further understanding in ocean and coastal environments;
- On November 2, 2007 passed out CNPCP outreach materials at the Louisiana Science Teacher Workshop in Lafayette;
- On October 18, 2007 in Port Allen and November 1, 2007 in Plaquemine; Atchafalaya East Watershed project, a stakeholder meeting addressing a Tri-Parish effort on flooding, water quality, fisheries and wildlife habitat, erosion, siltation, navigation, and non-point source water pollution.



Photo: John Hartgerink

The CNPCP is entering into Cooperative Endeavor Agreements with DEQ’s statewide nonpoint pollution control program for the use of EPA 319 grant funds for three CNPCP projects. A meeting was held with DEQ to discuss these projects on July 31, 2007. These three projects are part of our effort to reach full approval of our CNPCP. The first project which has been approved and has



# *Implementation and Improvement*

started is titled “CNPCP BMP manuals.” Three stakeholder meetings were held for this project. The first meeting was held on December 4, 2007 in Lake Charles, second one was in Baton Rouge on December 5, 2007, and the final meeting was in New Orleans on December 6, 2007. CNPCP staff attended all stakeholder meetings. When this project is completed Louisiana will have three BMP manuals unique to the Coastal Zone covering Urban Runoff Roads, Highways, and Bridges, Urban Stormwater Runoff, and Hydromodification activities. The second project which is pending approval is titled “CNPCP BMP Manual Training and Outreach.” This project, located in the western portion of the Coastal Zone, will develop, conduct training sessions, and provide outreach and educational opportunities for the CNPCP BMP manuals. The target audiences are local people involved in the construction and maintenance of roads, highways, and bridges. This project will be important and serve as a model which can be used in the future throughout the CNPCP area. The final project, approved in December 2007, is expected to start before the end of January 2008 and is titled “Wastewater Treatment Plant Assistance in North Shore Watersheds.” This project located in the eastern portion of the Coastal Zone will train a wastewater tech to assess and offer assistance to the owners of existing wastewater treatment plants, as well as educate the owners on the correct operation and maintenance of their wastewater treatment plants, particularly small home units.



During 2007, the Advisory Panel on Coastal Wetland Forests submitted a set of recommendations to the Governor’s Office involving management, research and policy needs for this important issue. LDEQ is currently working with a group of wetland and forestry scientists on a body of work to map the three condition classes of cypress-tupelo forests in order to manage them for long-term sustainability.

## **Coastal Nonpoint Pollution Control Program BMP Development**

The goal of this project is to meet the remaining conditions on the Louisiana Coastal Nonpoint Pollution Control Program (CNPCP) for urban stormwater runoff; urban storm water runoff for roads, highways and bridges; and hydromodification.

This project will correlate the Louisiana Department of Transportation and Development (DOTD) manuals of BMPs with the Management Measures listed in the Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters. This correlation of Louisiana DOTD BMPs with the 6217 Measures will facilitate 6217 reporting requirements for BMP implementation. A BMP manual and brochure will be created for use by local entities, contractors, governmental permitting agencies, and educators.

A Hydromodification BMP manual and an Urban Storm Water Runoff BMP manual will be created specific to the State of Louisiana, and the coastal nonpoint hydromodification management measures, and the coastal nonpoint urban management measures. This manual will be designed to be used by local entities, contractors, governmental agencies, and educators. The final product will be the basis for educational outreach.

# *Implementation and Improvement*

## **Louisiana Coastal Nonpoint Pollution Control Program BMP Manual Training and Outreach**

The goal of this project is to meet the remaining conditions on the Louisiana CNPCP for urban stormwater runoff for roads, highways and bridges, and appropriate sections of hydromodification.

The subcontractor proposes to assist the Department of Natural Resources by developing and conducting training sessions and providing outreach and educational opportunities on the practices outlined in the “Coastal Nonpoint Pollution Control Program BMPs Manual.” The subcontractor will target efforts towards reaching local people involved in the construction and maintenance of roads, bridges, and highways, encouraging the adoption of BMPs and policies in construction and maintenance of roads, bridges and highways in the coastal areas of Louisiana. This project will serve as a model which can be used in the future throughout the Coastal Nonpoint Pollution Control Program area.

## ***Hypoxia in the Gulf of Mexico***

The State of Louisiana has been concerned for many years with the occurrence of areas of low dissolved oxygen or hypoxia in the near shore waters of the Gulf of Mexico. And given our State’s resource-rich coastal zone and the fact that Gulf Hypoxia occurs primarily in waters off the Louisiana coastline, it is only natural that Louisiana has taken an active role in dealing with the issue of hypoxia in the Gulf of Mexico. Historically, Louisiana universities, particularly the Louisiana Universities Marine Consortium (LUMCON), and state and federal agencies have monitored the area of hypoxia in the Gulf and noticed a steady growing trend. Concern became even greater when the size of the hypoxic zone jumped from below 10,000 square kilometers to over 15,000 following the large Mississippi River flood of 1992. The Gulf hypoxic area has largely remained near 15,000 square kilometers since then.

The early scientific evidence on the cause of Gulf Hypoxia, which is still relevant today, shows that there is a link between the hypoxic zone and the flows of the Mississippi River and its major distributary, the Atchafalaya River. More specifically, studies have shown that the combination of constricted outflows of the Mississippi and Atchafalaya Rivers to the Gulf and their associated nutrient loads are related to the size and growth of the hypoxic zone. Because of this Mississippi River relationship to the Gulf hypoxia problem, the State of Louisiana and Louisiana Department of Environmental Quality (LDEQ) have addressed the issue through a watershed approach as developed under the Louisiana Nonpoint Source (NPS) Program and Clean Water Act Section 319.

Using the watershed approach, LDEQ in coordination with the Gulf of Mexico Program (GOMP) sponsored by the Environmental Protection Agency (EPA) began hosting meetings on hypoxia as early as 1995 with national environmental organizations such as the Environmental Council of the States (ECOS), the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA), the Lower Mississippi River Conservation Committee (LMRCC) and the Mississippi River Basin Alliance as well as federal and state agencies and universities. This educational and communication effort was expanded to meetings with upriver states in the Mississippi watershed. All these efforts led to the creation of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force in 1997. The task force, also known as the “National Hypoxia Task Force”, was charged with conducting an up-to-date scientific assessment of hypoxia on its characteristics and causes and developing a plan for reducing, mitigating and controlling hypoxia in the Gulf of Mexico. This

# *Implementation and Improvement*

charge was also written into law under the Harmful Algal Blooms and Hypoxia Research and Control Act, P.L. 105-383, 1998.

The National Hypoxia Task Force subsequently met seven times since its creation in 1997 in cities throughout the Mississippi watershed and successfully produced an, “Action Plan for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico” at a task force meeting in Baton Rouge in 2001. Since then that Task Force has met six more times and has scheduled its fourteenth meeting for June 12, 2007 in New Orleans. Through the efforts of the National Hypoxia Task Force, numerous documents have been produced and symposiums sponsored that further our knowledge of the Gulf hypoxic zone and help us refine our management strategy to address it. Presently the task force is working on a 5 year reassessment of the hypoxia action plan to “update” the plan with new information and management approaches.

A central focus of the hypoxia action plan continues to be a watershed approach and utilization of the resources and experiences of not only the Louisiana Nonpoint Source Program (Section 319) but also the NPS programs of states throughout the watershed. Through the task force established Sub Basin Committees, states throughout the watershed have identified pilot watershed projects for nutrient reduction using state NPS and other programs. For Louisiana, we have identified the Cabin-Teele watershed in the Tensas River Basin as a pilot project under the program. Although Louisiana water bodies do not drain directly into the Mississippi River because of levees, they do drain through the Red and Atchafalaya and other rivers to the Gulf where they can contribute to the hypoxia problem. Also important to addressing Gulf Hypoxia is the USDA Farm Bill programs some of which are being used in the upper Mississippi River watershed to address hypoxia. In a recently produced task force report entitled “Management Action Review Team Report” which is part of the hypoxia plan reassessment process, key provisions of the Clean Water Act Section 319 Nonpoint Source Management Program and the USDA Farm Bill are highlighted as programs that can be used to reduce nutrient runoff in the Mississippi River watershed. One such Farm Bill program, the Conservation Reserve Enhancement Program (CREP), is being used by the State of Iowa’s Department of Agriculture and Land Stewardship under their, “Iowa Hypoxia Reduction Initiative” to provide wetland filters at the headwaters of subsurface drained lands. Iowa is applying their CREP wetland program using a watershed approach to best address the higher nutrient loads that drain to the Mississippi River watershed. Using CREP after Iowa’s lead and other Farm Bill programs under a watershed approach offers a cost effective way to address the nutrient reduction in the Mississippi watershed that will be needed to reduce Gulf Hypoxia. New language in the recently proposed Farm Bill lists programs to support Gulf Hypoxia needs for the first time and is a good sign for the future.

Other nutrient reduction actions that are ongoing as identified in the Gulf hypoxia action plan include river diversions for Louisiana coastal restoration and point source nutrient reductions. These are valuable programs in their own right and necessary if we are to achieve our hypoxia reduction goal. Watershed based nonpoint source programs, however, remain as a vital part of the overall hypoxia reduction plan. For more information on the Gulf Hypoxia issue and the actions and activities of the Mississippi River/Gulf of Mexico Task Force see the website: [www.epa.gov/msbasin/index.htm](http://www.epa.gov/msbasin/index.htm).



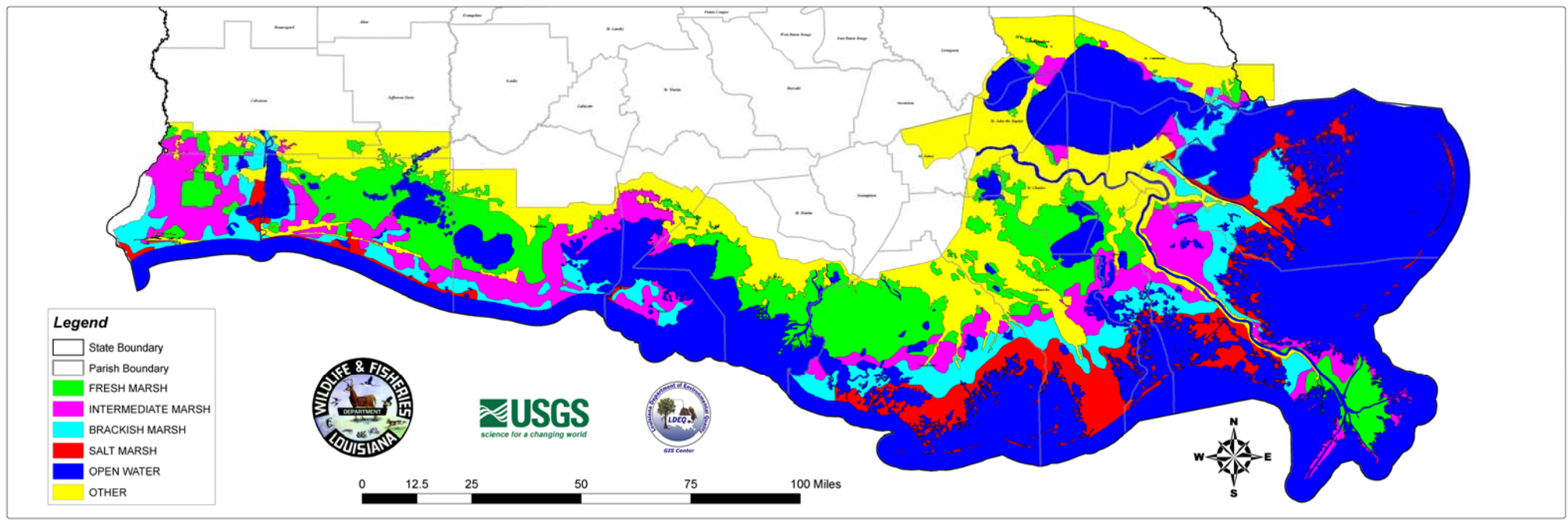
# Implementation and Improvement

## Vegetation Types of the Louisiana Marshes In 1997

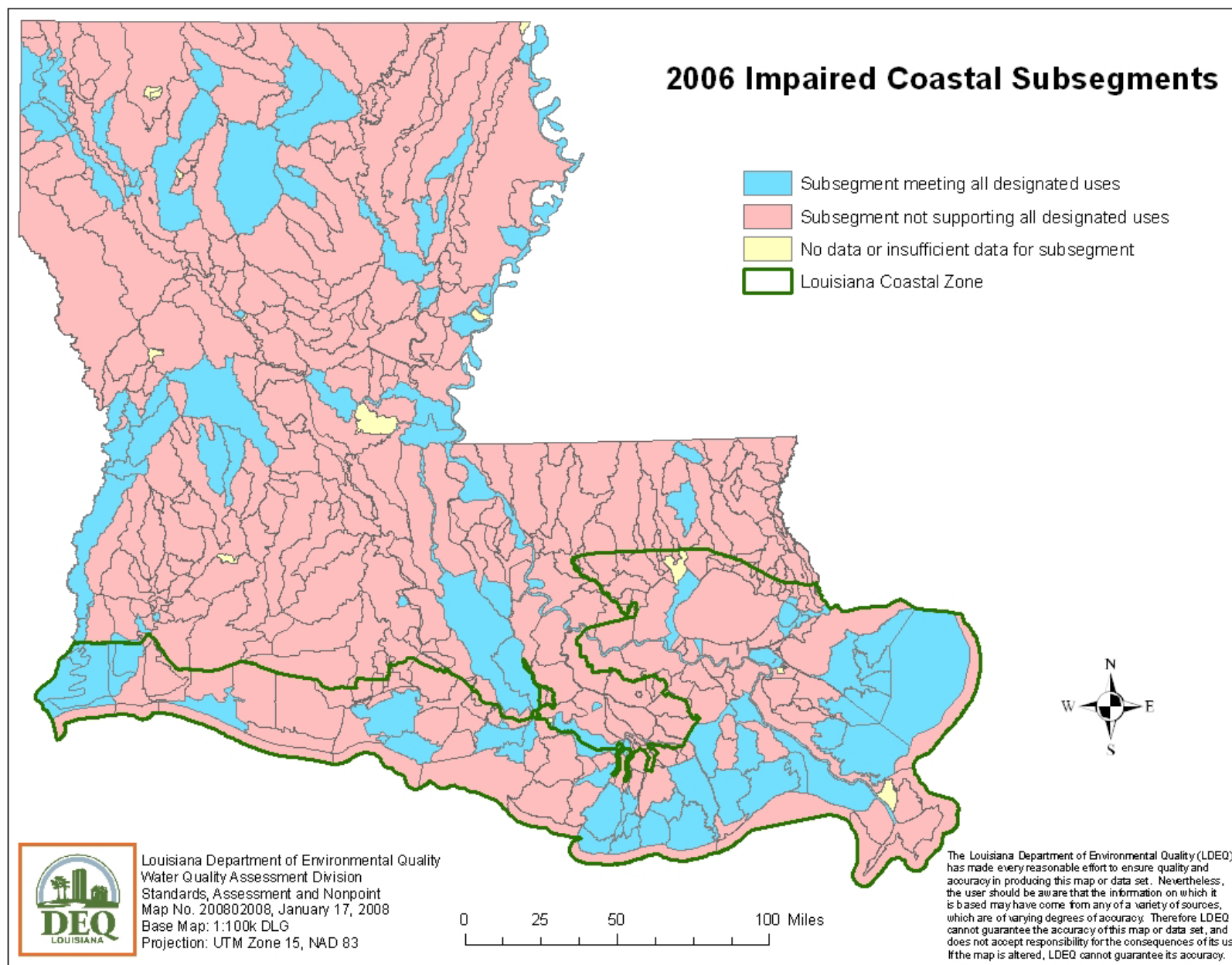
as Identified by Greg Linscombe of Louisiana Department of Wildlife and Fisheries  
and Robert H. Chabreck of LSU Agricultural Center

Date: 03/22/2005  
Map Number: 200501046  
Map Projection: UTM Zone 15 NAD83  
Map Sources: 1001/1998 USGS marsh type delineation lines produced by freehanding contours through on-screen interpretation of GPS point data, and digital imagery (TMSPOT Merge), NWI habitat vector data, and the collected data were utilized to create a line for the coastwater boundary and a line for the upland/marsh boundary; 1999 LDOTD State & Parish boundaries

LDEQ Disclaimer: The Louisiana Department of Environmental Quality (LDEQ) has made every reasonable effort to ensure quality and accuracy in producing this map or data set. Nevertheless, the user should be aware that the information on which it is based may have come from any of a variety of sources, which are of varying degrees of accuracy. Therefore, LDEQ cannot guarantee the accuracy of this map or data set, and does not accept any responsibility for the consequences of its use.

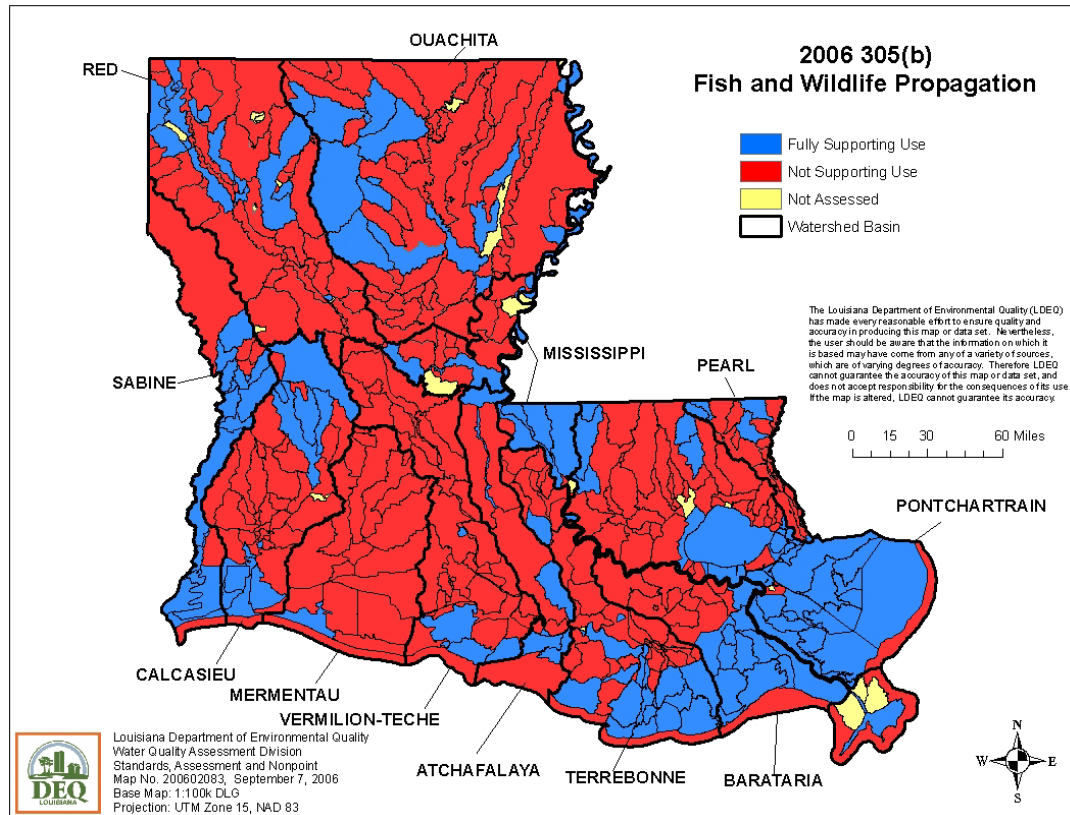


# Implementation and Improvement



# Implementation and Improvement

## Statewide



In addition to nonpoint source projects that have been targeted at the watershed level, there have also been programs implemented during 2007 to address nonpoint source concerns on a statewide scale. This allows progress to be made across the state rather than only in targeted watersheds. The NPS Management Plan also included tasks and milestones for implementation of statewide programs for agriculture, forestry, urban runoff, home sewage, hydromodification, construction and resource extraction. During 2007, LDEQ has worked with many entities to make progress in implementing the statewide NPS Programs.



Sand and gravel mines along the Amite River

### Progress in Sand and Gravel Mining BMPs

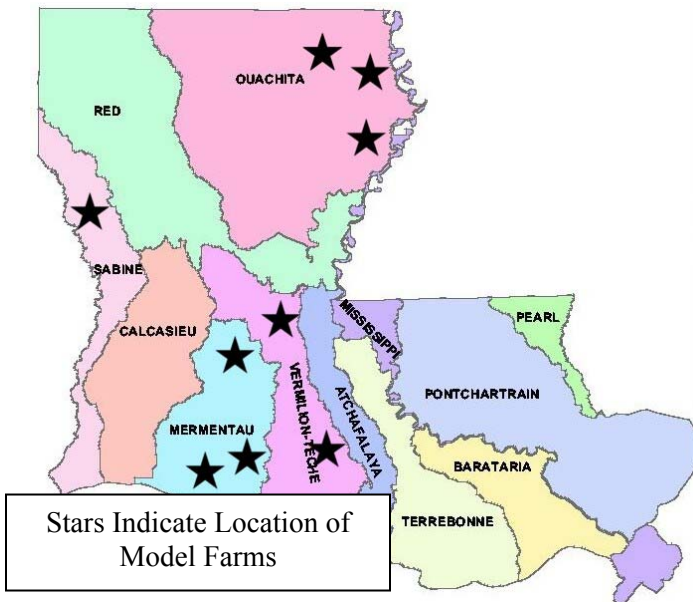
During 2007, LDEQ continued to work with the Concrete and Aggregate Association to complete a BMP manual for sand and gravel mining. The BMP manual is expected to be available to the industry and the public in early 2008. The manual concentrates on the types of BMPs that need to be implemented, from the initial stages of site clearing to site restoration following the mining operation. The goal of the manual is to standardize the range of practices for sand and gravel mining operations in order to limit the impacts that these operations have on water quality within the State of Louisiana.



# Implementation and Improvement

## Promoting the Adoption of BMPs through the Use of Model Farms

This project was completed in 2006 and the Final Report is in review at EPA. The Louisiana State University AgCenter, with cooperation of multiple state agencies and agricultural groups, has been working on the implementation of the Master Farmer program since 2001. A vital phase of this program is having producers visit a Model Farm, and see firsthand the proper use of conservation practices in agriculture. This project implemented nine Model Farms in four major river basins, consisting of three pasture/cattle operations, three rice/crawfish operations, and three row crop operations.



Several Model Farm field days were hosted during this project. There was at least one field day representing each of the Model Farms. These field days provided an opportunity for concerned and innovative producers to see what their peers are doing and planning in terms of conservation. Participants were able to see first hand how these practices are implemented on a real farm in their area, not just a temporary setup on a research station used for demonstration. The cooperators as well as personnel from state and federal agencies presented information which is valuable in making decisions about responsible conservation farming. The attendance for these field days averaged around 40 people per event.

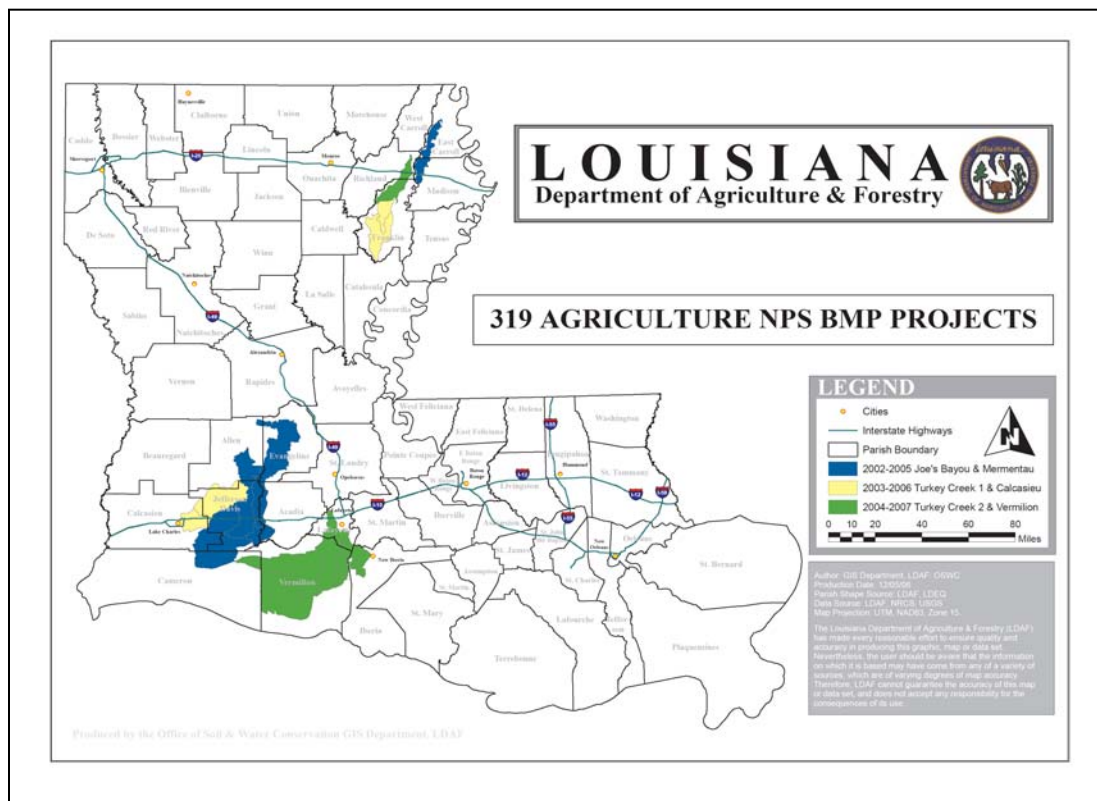
The current status of producers' knowledge and perception of conservation farming was assessed using a survey mailed to over 3,100 producers around the state. Over 42% responded with a completed survey. This information will lead to an increased understanding of how conservation education should be approached. The Master Farmer program as well as future conservation programs will benefit.



# Implementation and Improvement

This project has played a vital role in the development and execution of phase II of the Master Farmer program in the state of Louisiana, providing the support for key personnel, the setup of monitoring stations, water quality analysis, travel throughout the state and region, and all material produced to enhance the success of Model Farm field days. Today the Master Farmer program is a model for the nation; many states have shown interest in developing similar programs in their respective states.

In addition to the work that LDEQ has funded with Section 319 funds, the Office of Soil and Water Conservation has worked on implementation of agricultural BMPs through the incremental Section 319 funds. This map illustrates how much of the state has been included within some of these programs and the table of acreages of BMPs implemented provides a summary of what NRCS has accomplished during this past year.





# Implementation and Improvement

## Louisiana Forestry Best Management Practices Education Project

This project was completed in 2007 and the Final Report is currently in review at EPA. Forestry occupies more land than any other agricultural commodity in Louisiana, and trees are the state's number one crop. Louisiana's forest industry has for some time realized the necessity of encouraging environmental stewardship with respect to the maintenance of water quality in areas utilized for forest production. Even though the forestry community leads Louisiana in implementing Best Management Practices, there is the desire among public and private sector leaders that the forest products community in Louisiana continue to lead the state and, indeed, the region in striving to achieve the highest possible compliance with voluntary forestry best management practices (FBMPs). One strategy to increase compliance that has been recognized by all concerned parties is continued education of the forestry community, the logging community, forestry educators themselves, and the general public.



During 2003, the new forestry BMP Manual was completed and an initial 40,000 copies were printed. These copies were distributed within the first six months after they were finalized. There is such a demand for forestry BMP manuals and educational materials within the state that it is difficult to keep pace with the demand. One way to achieve greater efficiency with educational programs is through the use of new and emerging communication technologies such as the Internet. Whereas all of the landowners and foresters may not have access to the Internet, many of



them do and can access information on a regular basis. As more people rely on electronic media to obtain information, government and private sectors need to maximize the efficiency of this tool for distribution of information on a broad



# Implementation and Improvement

scale. Louisiana's Nonpoint Source Management Plan committed to a 15-year schedule for measurable water quality improvement from statewide educational activities, so it is important that these programs reach the largest audience possible.

The overall goal of the project is to educate a diverse audience of loggers, foresters, forest industry leaders, non-industrial private forest landowners, educators, and other interested stakeholders by means of an interactive website and CD. The focus is on environmental and economic benefits of FBMPs, the proper implementation of FBMPs, proper contracting to ensure compliance with FBMPs, site evaluation by non-industrial private forest landowners or their professional representatives to ensure contractual performance, and other miscellaneous issues associated with FBMPs. The website and CD will be developed by the Louisiana Cooperative Extension Service with input from a broad working group of experts on FBMPs.

## USDA Programs

The USDA spent \$14,374,536 of Farm Bill funds (which are not 319 funds) in 2007 on 1,131 EQIP contracts, which covered 141,413.7 acres throughout the state. In 2007, the USDA also spent \$373,373 of Farm Bill funds on 37 WHIP contracts, which covered 1787.9 acres throughout the state. As of September 12, 2007, USDA had entered into 6 easements on 988 acres for the Wetland Reserve Program and an additional 3 new easements for 689 acres were in the process of being finalized.

Throughout the state of Louisiana, the USDA implemented approximately 32,912 acres of BMPs through the CRP, 118 acres through the CSP, 506 acres through the GRP, 20,351 acres through the WRP, 194,704 through the EQIP, and 6,193 acres through the WHIP

Through all of its programs, the USDA implemented a total of 385,026 acres of BMPs throughout the state. The following chart shows approximately the total number of acres of implemented BMPs per basin.

Basin	Acres of USDA Implemented BMPs
Atchafalaya	18,009
Barataria	10,211
Calcasieu	27,997
Mermentau	51,798
Mississippi	11,514
Ouachita	102,125
Pearl	7,758
Pontchartrain	38,370
Red	46,776
Sabine	13,592
Vermilion-Teche	21,595
Terrebonne	35,269

# Source Water Protection Program

LDEQ's Source Water Protection Strategy is implemented through its Source Water Assessment Program and Source Water Protection Program. LDEQ's Source Water Protection Program is officially known in Louisiana as the Drinking Water Protection Program, however for this document, it will be referred to as the Source Water Protection Program to fit with EPA's nomenclature. The main goal of the LDEQ's Protection Strategy is to protect all sources of potable water for public water systems from contamination. Under the Source Water Assessment Program, LDEQ has located all public water supply sources and evaluated their susceptibility to contamination. The information derived from this Program is used by various sections within LDEQ, by various outside agencies, and directly in the implementation of the Source Water Protection Program in order to protect water supplies. The Source Water Protection Program operates on a parish or regional (combination of parishes) basis, depending on the local situation.

## *Louisiana Source Water Protection Strategy Elements*

Key elements of the Louisiana Source Water Protection Strategy consist of the following:

1. Maintenance of updated Source Water Assessment Program data, which includes information on sources of drinking water (wells or intakes) and a list of potential sources of contamination located near those drinking water sources.
2. Development of contingency plans for all water systems in each targeted community that will give those water systems a plan in place in the event of an emergency or the loss of the water supply.
3. Implementation of public education/awareness campaigns to educate the local public on where drinking water comes from, why it's important to protect it, and how it can be protected.
4. Formation of Source Water Protection Committees made up of local residents from the parish(s) being targeted at the time. Each Committee is trained on its role in drinking water source protection within its community and best management practices (BMPs) that may be used to control pollution in the vicinity of their drinking water supplies. Source water protection goals are set and carried out with each committee.
5. Distribution of BMPs to various businesses/activities that are considered potential sources of contamination as identified in the Source Water Assessment Program, in conjunction with the Source Water Protection Committees.
6. Development and distribution of educational/outreach material as needed for the community to help protect its drinking water, in conjunction with the Source Water Protection Committees.
7. Addressing the most threatening potential sources of contamination in each community.
8. Addressing specific issues affecting water sources that each committee and local community deems necessary.
9. Addressing the specific nonpoint sources of contamination that have been identified as affecting water supplies.



# Source Water Protection Program

10. Working with each committee to get an ordinance passed by local governments which affords further protection of the drinking water source.

## *Louisiana Source Water Protection Strategies Implemented in 2007*

Implementation of scheduled source water protection strategies in 2007 included:

- Signage: 172 Drinking Water Protection Area Signs were delivered to communities in Rapides, Bossier and Grant parishes for placement on the highways at the boundaries of Source Water Protection Areas,
- Workshops: 3 community meetings and 22 local committee meetings took place within 7 parishes
- Public Education and Outreach: 507 potential sources of contamination were visited by committee members, mainly in urban areas, educating citizens about potential pollution of their local drinking water source with an emphasis on nonpoint source pollution,
- Passage of Ordinances: 5 ordinances were passed by local governments in 2 parishes prohibiting some nonpoint type activities within a certain distance from public drinking water wells.



## *Examples of NPS Issues Addressed in 2007 by the SWP Program*

LDEQ strives to address specific nonpoint sources of contamination that have been identified as affecting water supplies within the framework of its Source Water Protection Program. This has become particularly important when working with surface water supplies. However, it is done as well for ground water supplies. Specific projects are utilized to address nonpoint source contamination, some of which have been mentioned above, such as used oil recycling education and visits to potential sources of contamination (some of which are nonpoint sources). LDEQ has also worked in some communities to educate citizens on individual sewage treatment system maintenance.

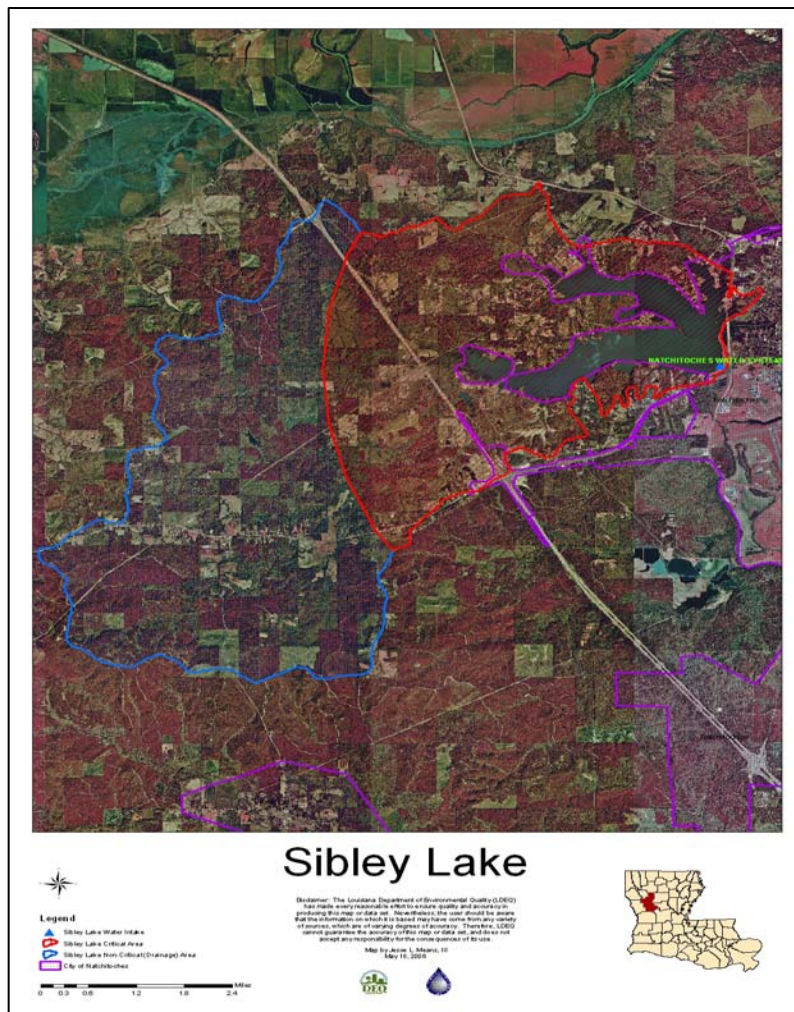
### *Natchitoches Parish*

The Sibley Lake Watershed Individual Sewage Treatment System Improvement Project offers the most current example of one way LDEQ addresses specific nonpoint sources of contamination around a water source. Located in the Red River Basin in Natchitoches Parish, Sibley Lake is the drinking water supply for the City of Natchitoches, the Village of Clarence, and the community of Hagewood. It is also the water supply for the unincorporated areas around the lake and along the water distribution system between the above listed municipalities. The total population served is almost 25,000. The critical watershed drainage area (a maximum of 5 miles upstream from the intake) is outlined in red on the map at right. The area in blue represents the lake's total watershed. The watershed surrounding the lake consists of urban and rural land. The area immediately surrounding the lake has a significant amount of residential development and most of this development is located outside the corporate limits for the City of Natchitoches. On the map, the



# Source Water Protection Program

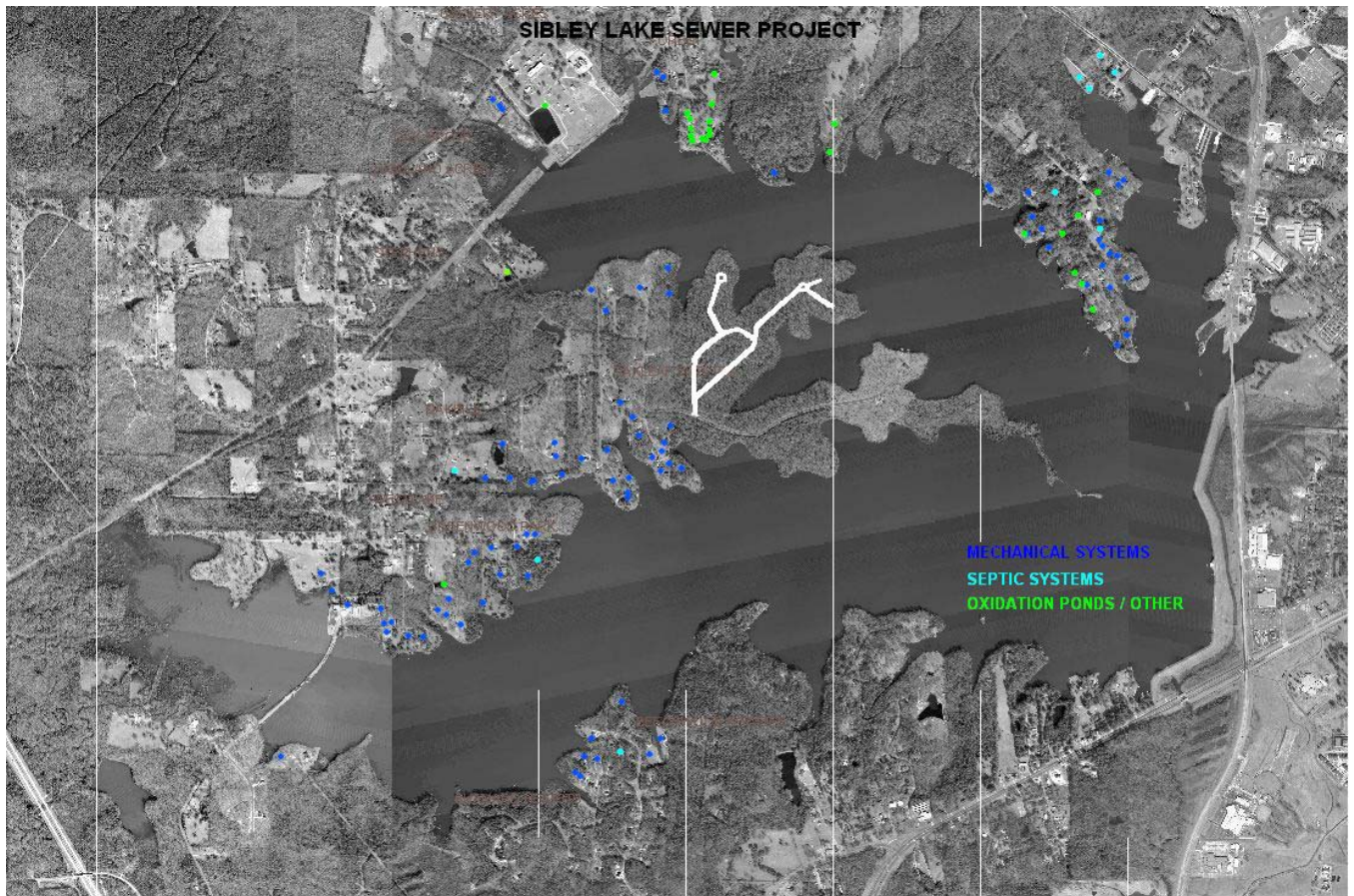
corporate limits of the City of Natchitoches are shown in purple. Because most of this development is located outside the municipal limit, no centralized sewage system exists there, and therefore it is served by individual sewage treatment systems. These sewage treatment systems are in varying degrees of operational condition. Many of these systems are located within only a few hundred feet of the lake or its tributaries. Development of the property directly adjacent to and around the lake is expected to continue, which will increase the potential for sewage loading going into the lake. LDEQ has worked with the City of Natchitoches to protect their water source. As part of this effort, the City of Natchitoches, with LDEQ's encouragement and assistance, submitted a proposal for the Sibley Lake Watershed Individual Sewage Treatment System Improvement Project and it was approved by the Louisiana Office of Contractual Review. The project became effective on May 1, 2007 and will terminate on October 31, 2008.



The 319 funded projects enables the City of Natchitoches to inventory and inspect all individual sewage treatment systems within a half-mile of Sibley Lake, and, to the extent permitted by time and funding, additional areas beyond a half-mile which are immediately adjacent to tributaries. As part of the project, these systems will be located by GPS and all pertinent information on each system will be entered into the city's GIS System. Owners of failing individual sewage treatment units will be served notice that their systems must be repaired or replaced. Funding will be provided for the repair/replacement of failed systems on a cost-share basis. Owners of repaired/replaced systems will be required to sign a document stating that they will abide by continued maintenance requirements for as long as they own the repaired/replaced system. This project will enable the City of Natchitoches to mitigate the future threat of sewage loading in Sibley Lake and protect their source of drinking water and the health of those that swim and boat in the lake.



# Source Water Protection Program



The first quarterly report for the project was received by DEQ on July 12, 2007. During the first two months of the contract (May and June of 2007), the City of Natchitoches acquired equipment necessary for completion of the project. This acquisition period was to be completed by the end of June, but due to an emergency situation that had to be addressed with the City's municipal power plant, the contractor's personnel were unable to acquire all the equipment they needed. However, with LDEQ's permission, the acquisition period was extended into July. During this same time period, the contractor was able to proceed with the inventory/inspection phase of the contract, thus giving them a head start in this aspect of the project.

The second quarterly report for the project, covering the months of July, August and September, was received by DEQ on October 10, 2007. The City of Natchitoches reported that 115 properties within 0.5 miles of Sibley Lake were inspected and inventoried. Overall, most sewage systems inventoried this far have been found to be in good working order, with three or four having major problems and about ten or so having minor problems. This phase of the project will be completed by the end of February 2008. After the inventory/inspection phase is complete, the contractor will use a ranking system to determine priority and begin working on repair/replacement of malfunctioning individual sewage systems. The map depicts the mechanical plants, septic systems, and oxidation/other sewage systems surrounding Sibley Lake that have been inventoried during this project so far.

# Source Water Protection Program

## *Assumption, Lafourche, and Terrebonne Parishes*

A public education campaign was launched for Assumption, Lafourche, and Terrebonne Parishes in August of 2006 and four community meetings were held in the area. A source water protection committee has been formed for these three parishes which are located within the Barataria and Terrebonne Basins. Bayou Lafourche, which flows from the Mississippi River at Donaldsonville (in Ascension Parish) through Assumption and Lafourche Parishes from north to south toward the Gulf of Mexico, is a major source of drinking water for the entire area. It is the source of drinking water for every public water system in both Assumption and Lafourche Parishes and also for one of the public water systems in Terrebonne Parish. The remaining water systems in Terrebonne Parish also use water from Bayou Lafourche to blend with their existing water sources whenever those sources receive too much salt water from the Gulf of Mexico.

The source water protection committee held five committee meetings in 2007. Guest presenters included: Ellen Finger of the regional office of the Department of Health and Hospitals; Archie Chaisson of the Bayou Lafourche Fresh Water District; and Karen Fisher-Brasher of the Louisiana Department of Environmental Quality.



Committee members and LDEQ have visited facilities that are potential sources of contamination to educate them on best management practices to prevent pollution from getting into the waterways. Of the facilities visited, 219 are located within the drainage area for Bayou Lafourche. Since urban runoff has also been identified as a significant contributor of nonpoint source pollution into Bayou Lafourche, it is important that these facilities know that prudent operation on site is important so that contaminants do not end up beyond their premises and in the bayou. Visits to potential sources of contamination have been completed.

LDEQ's sampling efforts show that where Bayou Lafourche is a drinking water source, it is not meeting its primary contact recreation (swimming) and fish and wildlife propagation (fishing) designated uses. Dissolved oxygen and total fecal coliform criteria are not being met. Further downstream, toward the Gulf of Mexico, where the bayou is not a drinking water source, it isn't meeting its fish and wildlife or its oyster propagation designated uses. The dissolved oxygen criterion is not being met. These sampling results highlight a problem of sewage loading in the bayou.

## *Bayou Lafourche Sewage Project*

LDEQ is trying to address the fecal coliform issue in Bayou Lafourche by locating malfunctioning home on site sewage systems. A contract with Nicholls State University to perform sampling of ditches that are receiving effluent from home sewage units has been developed. Ditches that ultimately drain to the bayou will be sampled. The data will be reported to LDEQ once it is compiled. If there is a demonstration that on site decentralized sewage systems are a major contributor to the Bayou Lafourche problem, the data will be used to convince people of the need of a source of funding to resolve the problem and to convince the local government to take a



# Source Water Protection Program

leadership role in protecting the welfare of its constituents. This includes, but is not limited to, the adoption of a local ordinance to give the local government the authority to inspect sewage systems and order the repair/replacement of malfunctioning/inoperable systems. Consideration will also be given to an attempt to have individual onsite sewage systems combined into a community type system to better control polluted discharges into the environment.

Additional support was provided by other LDEQ Divisions for the Bayou Lafourche area at the Source Water Protection staff's request. This support was in the form of the Bayou Lafourche



Algae in Bayou Lafourche

Watershed Inspection Project. LDEQ's regional offices sampled for fecal coliform at bridges down the length of the bayou and inspected 769 facilities from Donaldsonville to Leesville for all-media compliance. This resulted in staff writing 285 notices of deficiencies to facilities not having a permit to discharge. Also, 30 referrals were made to enforcement and another 30 warning letters were sent out. This collaborative, targeted watershed approach served as a pilot for the newly developed Clean Waters Program.

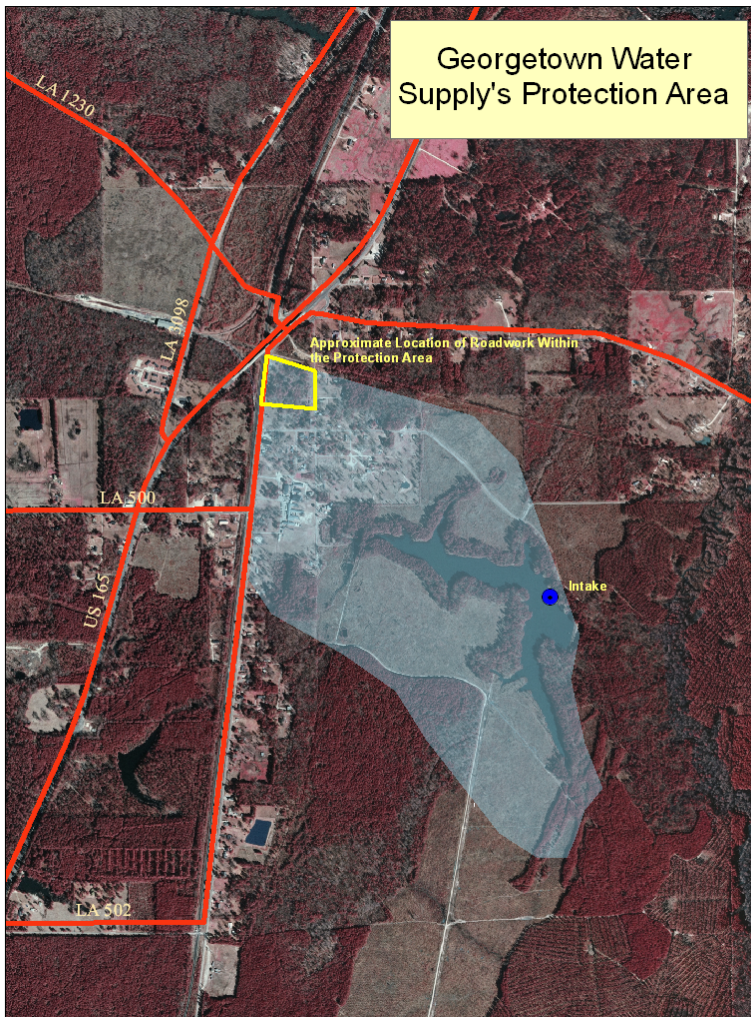
## ***Grant Parish***

### ***Protecting Georgetown's Drinking Water Reservoir From Road Construction Runoff***

During 2007, LDEQ monitored construction activities on U.S. Highway 165 that occurred near the Village of Georgetown's (Grant Parish) public water supply source. Previously in the summer of 2006, LDEQ had become involved in negotiations to decide upon a protocol which would protect Georgetown's reservoir during the road construction on the portion of U.S. Highway 165 that crosses the northwest portion of the reservoir's protection area. See the map below.

An agreement was reached between Louisiana TIMED Managers (the contractor handling the construction of the highway) and the Village of Georgetown, the Louisiana Department of Health and Hospitals, the Louisiana Rural Water Association, and LDEQ. The special precautions included waiting to clear the area in question last, not staging or washing vehicles/equipment within the protection area, not storing any hazardous materials within the protection area, the construction of storm water runoff/cleanup control structures, and the staging of spill control equipment near the area in case of the release of any hazardous material.

# Source Water Protection Program



On Tuesday, July 17, 2007 the Village of Georgetown's water operator informed LDEQ that the contractor performing the road construction was going to initiate construction within the Georgetown reservoir's protection area the following day. He further stated that the contractor had not yet put into place the previously agreed upon storm water and pollution control structures that were stipulated in the cooperative agreement. LDEQ in turn contacted the contractor, who then halted construction and put protection measures into place. LDEQ followed up with an inspection of the portion of the construction site within the reservoir's protection area. The inspection found that, apart from some minor issues that needed to be addressed, the overall performance of the storm water and pollution control structures the contractor had put into place were sufficient to protect the reservoir. The contractor was notified of the findings and stated that the follow-up work to address the minor issues would be conducted accordingly.

## ***Sand and Gravel Mining Industry BMP Guidelines***

Through Source Water Protection Program and Nonpoint Source Program coordination, LDEQ developed a Sand and Gravel Mining BMP Manual. The Source Water Protection section of the manual deals with ground water and public supply wells with concern about the mining of drinking water aquifers and the potential harmful effect on the wells. Within the guidance, industry representatives agreed to a 1000 foot setback distance from such wells when conducting their operations.

## ***Protection Activities in Targeted Parishes***

### **Jefferson Davis Parish**

One Jefferson Davis Parish Drinking Water Protection committee meeting was held in February of 2007. Current committee work is focused on the passage of ordinances, and committee meetings are held as needed. The Jefferson Davis Parish Police Jury passed the source water protection ordinance on November 8, 2006, the Town of Welsh passed the ordinance on March 6, 2007, and the City of Jennings passed the ordinance on November 11, 2007. The Town of Lake Arthur has an existing source water protection ordinance in place from July 14, 1997.



# *Source Water Protection Program*

There have been 117 visits to potential sources of contamination completed in Jefferson Davis Parish. The committee visits potential sources of contamination letting them know they are close to a drinking water source and hands out BMPs for the particular concern. In some cases the concern could be an abandoned gas station that needs closure; otherwise it could turn into nonpoint source contamination of an aquifer with the source unknown. In this case the station is reported for closure. Surface water runoff does result in water carrying pollutants through the ground into underground sources of drinking water. Then, like surface water, ground water moves and can carry contaminants beyond the originating source.

## **Lafayette Parish**

Since its inception in June of 2006, the Lafayette Parish Drinking Water Protection Committee has worked diligently on efforts to protect drinking water. The committee completed 248 visits to businesses within Source Water Protection Areas. Tim Duex, Professor of Geology at the University of Louisiana Lafayette, recruited his students to conduct the visits for the City of Lafayette and the Town of Youngsville. Angie Arnold with the LSU Cooperative Extension Service organized a group of 4-H Club students to visit businesses in the City of Carencro. To help educate the public, at large Mark Pope from the Environmental Division of the Lafayette Parish Consolidated Government participated in a radio show to promote drinking water protection. Committee members invited the Drinking Water Protection team to give presentations in several Lafayette Parish Schools, nursing homes, and a Lafayette Utilities System operator training session. An award ceremony was held on August 23, 2007 in Lafayette to recognize the committee members for their dedicated efforts to protect their drinking water.

Drinking Water Protection ordinances were adopted by the Town of Youngsville and the Town of Duson. An ordinance for the Lafayette Consolidated Government is pending. If the Lafayette Consolidated Government passes the ordinance it will affect all public water supply wells within Lafayette City limits and all wells in unincorporated areas of the parish, including Lafayette Parish Water Districts North and South and Milton Water System.

## **Rapides Parish**

The Drinking Water Protection staff began working in Rapides Parish in the beginning of 2007. They met with representatives from the 19 community public water systems serving Rapides Parish as well as local officials to introduce them to the source water protection program and encourage them to participate and attend the community meeting. The community meeting was held on March 22, 2007 in Alexandria, LA. It was advertised in local newspapers, on television and also by the City of Alexandria. The Rapides Parish Drinking Water Protection committee held its first meeting on May 10, 2007 and the committee, made up of 21 volunteers, continued to meet on a monthly basis throughout the year. The model ordinance was introduced at the July meeting. Committee members are currently working on visits to local businesses identified as potential sources of contamination to educate the owners and/or operators on how to protect drinking water. Work in Rapides parish will continue into 2008.

## **Bossier Parish**

The Louisiana Department of Environmental Quality's Drinking Water Protection Team began work in Bossier Parish at the end of June 2007. Staff members visited with representatives of the local water systems and other government officials to introduce the Drinking Water Protection



# *Source Water Protection Program*

Program. Bossier Parish has twenty-six active public community water systems. There is one surface water system and five (5) water systems that purchase surface water. The surface water system is the City of Bossier, and the source of drinking water is the Red River. There are twenty (20) ground water systems, ten (10) are municipal and ten (10) are non-municipal systems.

The Drinking Water Protection Team advertised for the parish program and community meeting through several media appearances and meeting announcements were mailed to over 250 parish contacts. Two community meetings and one committee meeting were held in the parish in 2007. Twenty volunteers signed up to serve on the Bossier Parish Drinking Water Protection Committee. Work in Bossier Parish will continue into 2008.



**The LDEQ Source Water Protection Team**

# Appendix A

**Appendix A List of projects by Basin that were active during 2007.**

Project Title	Grant Year	Basin	Project Status	Final Report Approval Status
St. James Parish NPS Education Program	2000	Barataria Basin	ended 2005	Yes, in 2007
Bayou Segnette Marsh Upwelling System Project	2000	Barataria Basin	ended 2006	Yes, in 2007
Upper Barataria Basin Watershed Protection/St. James Sugarcane Project	2000	Barataria Basin	ended 2007	Yes, in 2007
Urban BMP Training for Construction Runoff and Home Sewage Education Awareness	2001	Barataria and Terrebonne Basin	ended 2007	no
Central Calcasieu River Watershed NPS Project	2001	Calcasieu	ended 2006	no
Coastal NPS BMP Training and Outreach- Phase 2	2004	Coastal	in progress	no
Coastal Nonpoint Pollution Control Program BMP development	2001	Coastal	in progress	no
Louisiana Coastal Nonpoint Pollution Control Program BMP Manual Training and Outreach	2003	Coastal	in progress	no
St. Tammany Parish Home Sewage Reduction Education Program	2000	Pontchartrain Basin	ended 2006	Yes, in 2007
St. Tammany Watershed Coordinator	2000	Pontchartrain Basin	ended 2006	Yes, in 2007
Mandeville Neighborwoods Project	2001	Pontchartrain Basin	ended 2007	In review at DEQ
Storm Water BMPs in Wetland Landscape Design Planning, Construction at Woodlawn High School	2005	Pontchartrain Basin	in progress	no
St. Tammany Parish Tchefuncte and Bogue Falaya Watershed Implementation Project	2003	Pontchartrain Basin	ended 2007	In review at DEQ
Wastewater Treatment Plant Assistance in North Shore Watersheds	2003	Pontchartrain Basin	in progress	no
Reduction in Urban NPS pollution in the Lake Pontchartrain Basin	2001	Pontchartrain Basin	ended 2007	In review at EPA
Mitigating NPS in Urban Watersheds with Spatial Modeling, BMPs and Community Outreach	2001	Pontchartrain Basin	ended 2007	In review at DEQ
Modeling NPS and Land-Use in Bayou Plaquemine Brule	2005	Mermentau River Basin	in progress	no
Delta Technical Assistance for BMP Implementation in the Eastern Portions of the Ouachita River Basins	2001	Ouachita River Basin	ended 2005	Yes, in 2007
Monitoring the Effectiveness of Forestry BMP Implementation in the Flat Creek	2002	Ouachita River Basin	ended 2007	In review at DEQ
Evaluation of Effectiveness of Forestry BMPs for Water Quality within Two Watersheds of the Ouachita River Basin, Phase II	2001	Ouachita River Basin	in progress	no
Reduction in NPS Load in Bayou Chauvin	2005	Ouachita River Basin	in progress	no
Reduction of Pesticides and Nutrients in Bennett's Bayou Following Implementation of Best Management Practices (BMPs)	2005	Ouachita River Basin	in progress	no

# Appendix A

Project Title	Grant Year	Basin	Project Status	Final Report Approval Status
Monitoring the Effectiveness of Forestry BMP Implementation in the Flat Creek, Phase 2	2004	Ouachita River Basin	started 2007	no
Development of Site Conservation Plan and Addressing Nonpoint Source Pollution on the Pearl River, Louisiana	2001	Pearl River Basin	ended 2005	Yes, in 2007
Pearl River Watershed Monitoring and Source Identification	2003	Pearl River Basin	in progress	no
Development of TMDLs for the Red and Sabine River	2003	Red River and Sabine	in progress	no
Constructed Wetlands to Improve Water Quality for Whole-Farm Operations	2002	Red River Basin	ended 2006	In review at EPA
Application of Poultry Litter to Cotton Producing Areas	2000	Red River Basin	ended 2007	In review at EPA
Application of Poultry Litter to Forested Areas	2000	Red River Basin	ended 2007	In review at EPA
Cross Lake Watershed Individual Sewage Treatment System Improvement Project	2001	Red River Basin	ended 2007	no
Sibley Lake Watershed Individual Sewage Treatment System Improvement	2005	Red River Basin	in progress	no
Louisiana Forestry Best Management Practices Education Project	2000	Statewide	ended 2006	In review at EPA
Model Farm Demonstration Projects	2001	Statewide	ended 2006	In review at EPA
Approaches for Developing Attainable Nutrient Criteria for Louisiana Water Bodies: Rivers and Streams	2000 and 2004	Statewide	in progress	no
Nutrients, Dissolved Oxygen Conditions, Habitat and Fish Assemblage	2000 and 2004	Statewide	in progress	no
Identification of Critical Areas of Watersheds	2002	Statewide	ended 2007	no
Identification of Critical Areas of Watersheds	2002	Statewide	ended 2007	no
Technical assistance for Watershed Monitoring and Quality Assurance in the NPS Program	2003	Statewide	ended 2007	no
Identification of Critical Areas of Watersheds	2002 and 2004	Statewide	in progress	no
"Nonpoint Source Pollution: Louisiana State Surface Water Quality Conference 2007"	2004	Statewide	in progress	no
Identification of Critical Areas of Watersheds	2002 and 2004	Statewide	in progress	no
Maintenance and Support for LDEQ Nonpoint Source Pollution Website	2004	Statewide	in progress	no
Lower Vermilion River Watershed NPS Project	2001	Vermilion-Teche River Basin	ended 2007	In review at DEQ



# Appendix A

Project Title	Grant Year	Basin	Project Status	Final Report Approval Status
Evaluating the Effects of Reduced Cultivation/Elimination of Burning of Combine Harvest Residue	2002	Vermilion-Teche River Basin	ended 2007	In review at EPA
Statistical Evaluation of the Effectiveness of BMPs in the Mermentau/Vermilion-Teche Basin	2005	Vermilion-Teche and Mermentau River Basin	in progress	no
Reducing the Impact of Crawfish Aquaculture through Implementation of BMPs	2000	Vermilion-Teche and Mermentau River Basin	ended 2007	Yes, in 2007

# Appendix B

## Appendix B Project Summaries

### Reduction in Urban NPS Pollution in the Lake Pontchartrain Basin

This project ended in 2007 and the Final Report is being reviewed by EPA. The overall project goal was to improve awareness in the Pontchartrain Basin about nonpoint sources of pollution found locally, and to educate basin residence about practices that could reduce the generation of these pollutants emanating from their homes and yards. Specific objectives were to: develop factsheets to be available at educational centers, develop a manual of BMP fact sheets, create a tabletop display showing how to implement home BMP's, develop demonstration sites, survey attendees of demo sites and educational programs to monitor adoption of practices, and install a urban homeowner BMP web page on LSU AgCenter's website and link it to LDEQ's website.

This project created two demonstration sites of residential BMPs: one in Jefferson Parish (Lafreniere Park) and one in East Baton Rouge Parish (LaHouse on LSU Campus). The website that was created about urban BMPs can be viewed at:

[http://www.lsuagcenter.com/en/environment/water\\_issues/quality/Stormwater/Urban+Stormwater/Urban+Stormwater.htm](http://www.lsuagcenter.com/en/environment/water_issues/quality/Stormwater/Urban+Stormwater/Urban+Stormwater.htm)



Visitors at the Louisiana House

In total, 692 people are documented in the report as having participated in various programs. Other methods of outreach such as publication distribution and website usage cannot be quantified. The scope of work and nature of the project was never negotiated to quantify environmental changes due to education or adoption of household BMPs. Unfortunately, behavioral changes cannot be accurately quantified in large part due to the amount of time that expired in many cases from completion of an educational effort until completion of the project because of the substantial interruptions caused by Hurricane Katrina. Additionally, those same interruptions set the entire program schedule back significantly and forced the forgoing of the survey exercise that might, had it been possible for it to be implemented in a timely manner, yield some information about behavioral change.

# Appendix B

## **St. Tammany Parish Home Sewage Reduction Education Program**

This project ended in 2006 and the Final Report was approved by EPA in 2007. Most of the soils in St. Tammany Parish are not suitable for effective use of septic tank absorption fields. As a result, many individual homes in rural and other unanswerd communities have installed septic tank systems that do not operate effectively and may not be maintained properly. The prevailing factors which decrease the efficient operation of many on-site sewage disposal systems are poor soil absorption, the lack of adequate maintenance, and homeowners who are unfamiliar with the proper operation of such on-site systems.



Absorption Field for home sewage disposal system

As a result of this project, it is now required in St. Tammany Parish to have an inspection of existing on-site sewage disposal systems to insure that these systems are functioning properly prior to the issuance of any Certificate of Occupancy and/or the connection of electrical power service. Funding was also made available for additional environmental inspectors or other appropriately licensed personnel to conduct inspections of existing on-site sewage disposal systems. An educational outreach program was developed and implemented to inform residents and businesses about on-site sewage disposal systems and the need for proper operation and routine maintenance. Additional sources of funding were pursued to assist qualified low income residents with the expenses of maintenance and/or repairs required to accomplish the proper functioning of their on-site sewage system.

## **St. James Parish Nonpoint Source Pollution Educational Camp**

This project was completed in 2005 and the Final Report was approved by EPA in 2007. Starting in the summer of 2000 and continuing over the next five years, the St. James Parish Great River Camp Program was piloted throughout St. James Parish, Louisiana. The Great River Camp 2000 program was collaboration between the St. James Parish School Board and the St. James Parish Council. The St. James Parish Great River Camp 2000 invited all St. James Parish youth, between the ages of 5 – 13 to participate in a summer camp that provided hands-on experiments related to nonpoint source pollution under the guidance of science experts and educators. Nearly one thousand St. James Parish students participated in this program which was held throughout the summer at four sites in the parish: Romeville Elementary School, Vacherie Elementary School, Lutchter High School, and St. James High School.

Portions of St. James Parish are located in three watersheds: Pontchartrain Basin (East Bank of the Parish) and Barataria Basin (West Bank of the Parish), and the Mississippi River Basin. The ultimate objective of this camp is to implement activities, control measures and innovative technologies through a very specific and comprehensive environmentally-based nonpoint source pollution curriculum using a purely hands-on format to educate 5 to 20-year-old students in order to reduce the level of pollutants entering water bodies in St. James Parish.



# Appendix B

## **St. Tammany Parish Watershed Coordinator, Implementation and Educational Outreach**

The project was completed in 2006 and the Final Report was approved by EPA in 2007. This project incorporated erosion control inspections, educational workshops, demonstration projects, online resources, a public access video presentation, complaint response, floodplain conservation, and ordinance revision, among other efforts to improve the ambient water quality of St. Tammany Parish.

Educational workshops were conducted for the St. Tammany Homebuilders Association, engineering firms, and area developers to address nonpoint source pollution and storm water runoff. St. Tammany Parish hosted a Nonpoint Source Pollution Workshop, a LDEQ Storm water Pollution Prevention Plan presentation, a LDNR Louisiana Clean Marina Program presentation, and a six hour Watershed Management Workshop and Field Demonstration Project with a cumulative total attendance of 182 contactors, engineers, and developers.

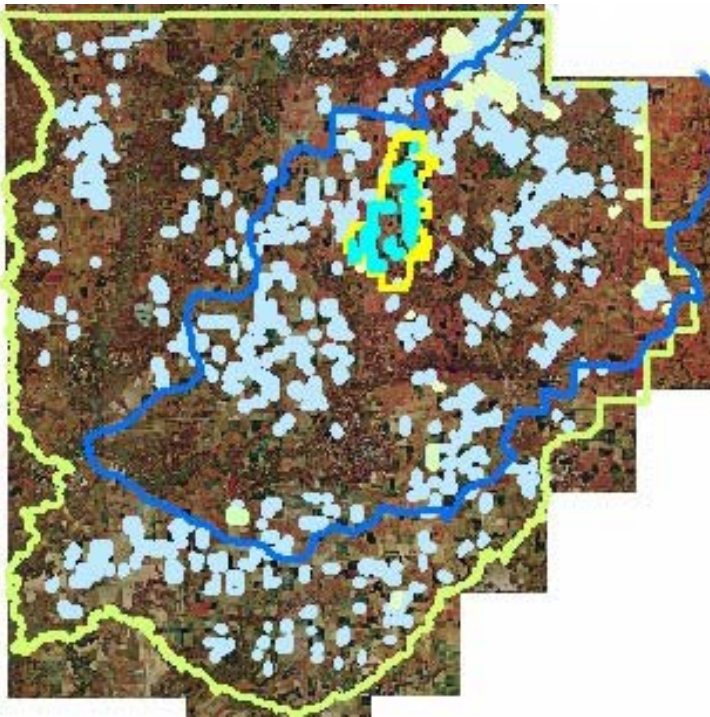


A Critical Drainage Map was developed as a useful tool for contractors, developers, realtors, engineers, and the general public to determine the critical drainage status of particular sites in St. Tammany Parish. A total of 119 new subdivision plans were reviewed for sediment barrier implementation and erosion control methods; 9,617 building permits were reviewed in an effort to reduce impacts of erosion due to excess fill and sedimentation; 19,234 erosion control inspections were performed during drainage inspections, with a pre-pour inspection and a final inspection required for each building permit.

# Appendix B

## **Reducing the Impact of Crawfish Aquaculture through Implementation of BMPs**

This project was ended in 2007, but it was not entirely completed due to the Principal Investigator being ill. Most of Louisiana's 130,000-acre crawfish farming industry is located in south-central and southwest Louisiana in the Mermentau and Vermilion Teche river basins, but the impact of crawfish aquaculture effluents on stream water quality in southern Louisiana is not known. This project focused on commercial crawfish farms in the Cole Gully sub-watershed, Bayou Plaquemine Brule, Acadia Parish. Two crawfish BMP facts sheets and a completed water quality chapter outlining crawfish water quality management practices were created.



Blue dots identify commercial crawfish ponds in Cole Gully sub-watershed, Bayou Plaquemine watershed, Acadia Parish. Acadia parish is identified by green boundary, Bayou Plaquemine Brule watershed identified by blue boundary, and Cole Gully sub-watershed by the yellow boundary.

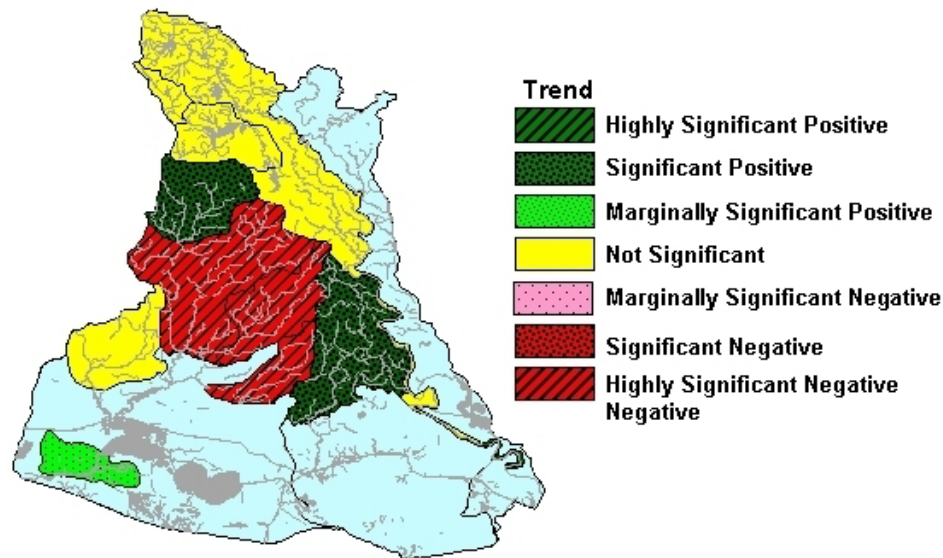
Investing in the equipment, facilities and manpower to monitor and maintain proper water quality in crawfish production, especially with regard to dissolved oxygen, is generally very cost-effective. A number of practices, however, can be adopted to reduce the need for water exchanges. These practices, in turn, reduce overall costs, increase production efficiency and reduce potential or perceived negative impacts to surrounding watersheds.

# Appendix B

## Statistical Evaluation of the Effectiveness of BMPs in Improving Water Quality within the Mermentau and Vermilion-Teche River Basins

This project is currently in progress and proposes to utilize existing long-term datasets collected from the Mermentau and Vermilion-Teche River Basins in Louisiana. For more than two decades, a large number of projects were conducted on water quality along Louisiana's shore of the Gulf of Mexico. However, little knowledge has been actually gained about the impact of hydrological and hydrometeorological variability on the dynamics of water quality parameters and the effectiveness of BMPs on the health and integrity of ecosystems and coastal watersheds. Upon completion, this project will provide critical insights into the interrelationships between BMPs, hydrological and hydrometeorological conditions, land use, and the water quality of inland streams, wetlands, and coastal estuaries in Louisiana. The knowledge and results gained from this project will contribute to the understanding of whether BMP programs are working, or whether other factors, such as climate and land-use changes, are making it difficult to detect water quality benefits that may have resulted from BMP utilization.

Preliminary results of this project show that February and April are the two critical months of the worst water quality, in terms of TSS and turbidity. The main pollution source in February is soil/sediment erosion caused by wet weather runoff and high river flow. The severe pollution in April is mainly caused by releases of muddy rice field water but wet weather runoff makes the water quality even worse. Both the highest TSS and the highest turbidity occur in February in the Vermilion-Teche River Basin, implying that the main pollution source in this basin is the soil/sediment erosion caused by wet weather runoff and high river flow. However, both the highest TSS and the highest turbidity occur in April in most watersheds in the Mermentau River Basin except the Bayou Plaquemine Brule watershed, signifying that the main pollution source in this basin is the releases of muddy rice field water.





# Appendix B

## **Evaluation of Effectiveness of Forestry Best Management Practices for Water Quality Improvement in the Ouachita Basin: Phase II**

This project began in 2005 and is scheduled to end in 2008. The most recent statewide survey conducted by the Louisiana Office of Forestry indicated approximately 93% of the forestry lands surveyed utilized BMPs. In order to determine whether BMP implementation will result in reduced nonpoint source loading from forested lands, LDEQ will be working with Louisiana Tech University and Willamette/Weyerhaeuser/Forestry Industry Partners (FIP) to quantify the effectiveness of the BMPs in reducing nonpoint source loads within two watersheds of the Ouachita River Basin.



The specific goal of this project is to evaluate and determine the effectiveness of implementing forestry best management practices as a tool for reducing the introduction of forestry-related nonpoint source pollutants into water bodies within the state of Louisiana. Two sub-segment level watersheds will be utilized to determine the effectiveness of Forestry BMPs: the western part of the Dugdemona River watershed and the Castor Creek watershed. These areas are heavily forested, and the predominant land use in these watersheds is forestry. Water quality and quantity will be compared before and after harvesting treatments, and compared upstream and downstream of the harvesting sites.

# Appendix B

## **Reduction in Nonpoint Source Contaminant Loads to Bayou Chauvin in the Ouachita River Basin**



Bayou Chauvin

This project began in 2006 and is scheduled to end in 2008. The specific goal of this project is to identify specific sources of NPS loading to Bayou Chauvin watershed and implement BMPs that will improve water quality. This project will use existing water quality data, TMDLs, and inventory mapping and reconnaissance surveys to select and target locations along the watershed that are likely to contribute to NPS loading. Through targeted water quality monitoring, land use areas (agricultural/pasture, suburban, wetland) will be selected for implementation of BMPs and demonstration projects. Educational outreach programs will be developed to inform land owners of NPS issues through workshops, demonstration projects, and organization and training of action groups.

Visual observation of Bayou Chauvin has been conducted, and monitoring and TMDL reports were reviewed to determine starting points for sample site selection. Two sampling events were conducted and, based on both events, the significant sources of NPS appeared to be agricultural runoff and suburban storm drains.

# Appendix B

## **Reduction of Pesticides and Nutrients in Bennett's Bayou Following Implementation of BMPs**

The Bayou is part of a watershed that includes Bayou Lafourche, Boeuf River, and portions of the Ouachita River. The Bennett's Bayou watershed contains both urban and agricultural land use areas. These waterways are impaired due to pesticides, nutrients, suspended solids, organic enrichment and fecal coliform bacteria. During 2002, USEPA Region 6 developed Total Maximum Daily Loads (TMDLs) for dissolved oxygen and nutrients for Bayou Lafourche.

Bennett's Bayou serves as the outlet for drainage of at least three NPS contaminant loads into Bayou Lafourche. These areas are the Chennault Park Golf Course, the ULM farm, and a residential subdivision. The Chennault Park Golf Course was shown to be a source of NPS pollutants in a previous 319 NPS project. A BMP was developed that included creating a wetland detention basin to capture and attenuate contaminant runoff from the golf course. This involved dredging the wetland to form sediment basins and reseeding with native plant material. The BMP was completed in the spring of 2006. This project will evaluate the success of the wetland area in reducing simazine and orthophosphate levels in golf course runoff and eventually Bennett's Bayou watershed.

This project will also evaluate the long-term success of another BMP implemented in the Bennett's Bayou watershed. In 1999, the ULM farm, located upstream from the golf course, developed a BMP that included conservation tillage systems with nutrient and pesticide management, and grassed waterways. Selected water quality parameters and pesticides (i.e., atrazine) will be monitored during rainfall events in Bennett's Bayou to evaluate the continued success of these agricultural BMPs.



Bennett's Bayou

In 1998, LDEQ began working with the Louisiana Cooperative Extension Service to educate residents along Bennett's Bayou about nonpoint source pollution. The focus of this project was urban pollution associated with lawns and homes. The success of these educational programs will be evaluated in this project by measuring water quality of stormwater runoff entering Bennett's Bayou. It may be necessary to provide additional information about nonpoint source pollution to the local homeowners and re-apply storm drain markers around the neighborhood.



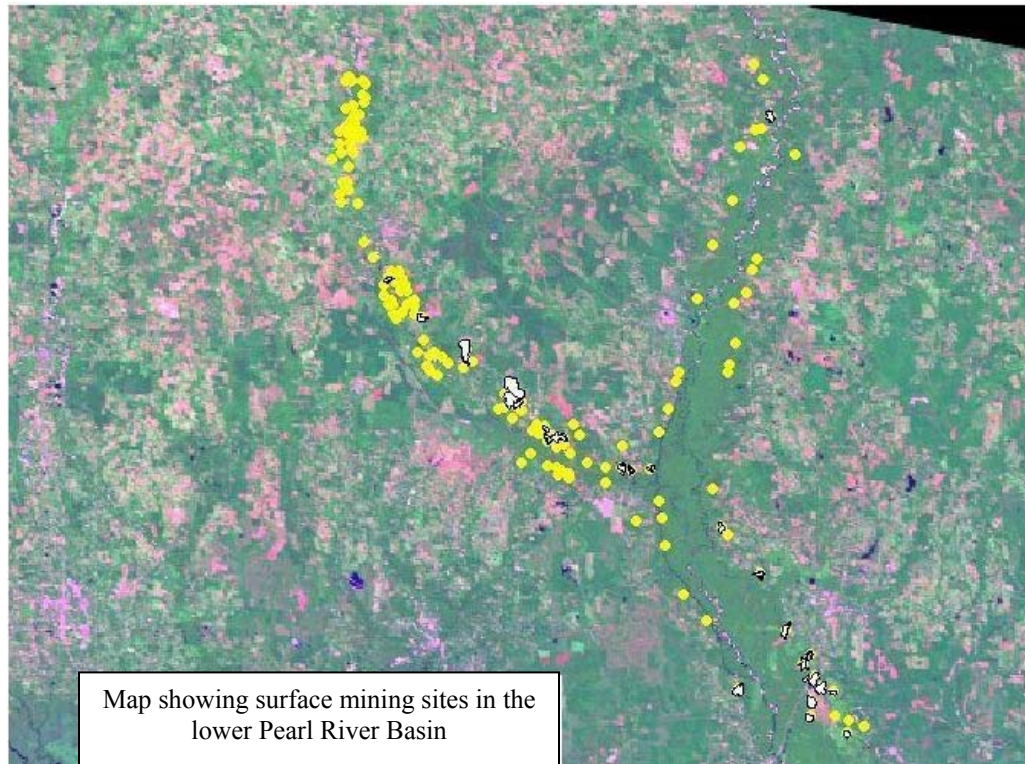
# Appendix B

## **Pearl River Watershed Monitoring and Source Identification**

This project is newly starting at the end of 2007. The Louisiana and Mississippi Departments of Environmental Quality have identified the Pearl River and several of its tributaries as impaired and not fully meeting its use for fish and wildlife resources due in part to high turbidity and sedimentation levels.

The Pearl River was identified by The Nature Conservancy as a priority for conservation attention because of its high

biodiversity significance. Continued excess sedimentation at high concentrations can make it difficult for a stream to recover. Nonpoint source pollution from sedimentation was cited as the possible reason the rare Pearl darter is extinct from the Pearl, and why several other riverine fauna such as the federally threatened Gulf sturgeon and inflated heel splitter may disappear within the next 10 years.



Tasks for the project include gathering and analyzing historic and current data on the geomorphology of the Pearl River and its major tributaries, as well as conducting a field-based assessment of channel stability and sediment flux of the lower Pearl River. The project will ultimately characterize whether changes in river channel morphology have occurred through time and will also highlight locations where bank instability and sediment input may be generating excessively high sedimentation levels at specific river reaches. The two primary

sources of excess sedimentation in the Pearl River are thought to be incompatible land use practices, such as incompatible sand and gravel mining, and changes in geomorphology of the stream.

# Appendix B

## **Evaluation of Application of Poultry Litter on Water Quality and Wood Production in Forested Lands, Phase 2**

This project ended in 2007 and the Final Report is in review at EPA. Forestry is a major land use activity in the northern portion of Louisiana close in proximity to poultry producing areas. The utilization of forests for application of poultry litter may increase forest (tree growth) and wildlife (browse growth) production through improvement in soil condition (organic matter content and cohesive properties) and by providing a slow release of nutrients and trace elements. The improvements in tree and browse growth and soil condition should improve water quality by reducing nutrient and sediment loading to receiving waters. This project will be useful in identifying and demonstrating the proper application of poultry litter on forest land in a manner that will assist in improving water quality, and provide more land area for beneficial land application.

The purpose of Phase 2 was to determine the effect of successive annual applications of poultry litter since 2000 on pine tree growth, growth of native vegetation, soil erodibility, and runoff water quality in a 25 to 30-years-old pine forest. The information provided through this project will be beneficial to the poultry producers and forestland owners, the Local Soil and Water Conservation Districts and the Natural Resource Conservation Service in making determinations in how they should utilize their poultry wastes most effectively. The results of the project will be incorporated into educational/outreach activities and included as recommendations made to forestland owners and poultry producers in the watersheds of north central Louisiana.



Results from this project to date indicate that poultry litter can be used successfully in forestry production to improve soil fertility, especially soils deficient in phosphorous, with acceptable impact on water quality. For reasons that are as yet unexplained, 4 tons of PL/A resulted in the greatest amount of nitrates, phosphates, total phosphorous and total nitrogen in runoff water. It is the fact that these levels were greater than those found in runoff from plots that received 6 and 8 tons of PL/A that is puzzling. It is possible that 6 and 8 tons of poultry litter stimulated understory growth that was more efficient in the uptake of these nutrients, since increasing poultry litter application did result in changes in understory species, but this hypothesis was not tested. Because this project was conducted in a mature pine plantation 25 to 30 years old, it was not surprising that the growth responses observed were minimal. That is to be expected with trees that at the end of their active growing

period. The remote location of this project site limited public access, however, results from this project were presented at the Forestry Forum in Shreveport on March 8, 2007 and at the Natchitoches Agricultural Day on March 24, 2007. The Forestry Forum was attended by area-wide producers, state and federal agency representatives and the general public.

# Appendix B

## **Cross Lake Watershed Individual Sewage Treatment System Improvement Project**

This project is scheduled to be completed at the end of 2007. Cross Lake serves as a drinking water supply for Barksdale Air Force Base and the City of Shreveport. Defective onsite residential sewage treatment systems present a significant nutrient, solids, and pathogen loading problem for the lake. This project will create a GPS-based inventory of individual sewage treatment systems within one-half mile of Cross Lake and enter data into the city's GIS system. Targeted areas within one-half mile of Cross Lake will be identified and prioritized. The owners of targeted property will be notified that their systems must be repaired or replaced. This project will result in the provision of funding for the repair/replacement of failed systems in the identified areas. Program participants will be required to sign a document stating that they will abide by the continued maintenance requirements specified by City Ordinances for as long as they own the replaced/upgraded sewage treatment system.

All home sewage treatment systems within 1,000 feet of Cross Lake were inspected by the City of Shreveport, and a total of 75 failing/malfunctioning systems were ranked using relevant criteria in an effort to quantify each system's relative impact to the lake. A printout of the inventory was submitted to LDEQ along with a map generated by the GIS database showing system locations. 54 letters of notification were sent to the owners of malfunctioning systems advising them of the need for repair/replacement, informing them of this funding opportunity, and detailing the procedure of submitting a contractor's proposal for repair/replacement.





# Appendix B

## **Approaches for Developing Attainable Nutrient Criteria for Louisiana Water Bodies: Rivers and Streams**

This project is currently being implemented is scheduled to end in 2008. This project is developing approaches for developing ecoregional nutrient criteria for Louisiana based upon the nutrient conditions found in least-impacted reference water bodies. Reference conditions will be evaluated for rivers and streams in the four ecoregions where nutrient criteria will be developed. Previously collected data will be evaluated on nutrients, dissolved oxygen, and other pertinent parameters in identified water bodies. Data will be analyzed to develop approaches for evaluating nutrient conditions in least-impacted reference water bodies.

To date, an extensive literature review of historical and current ecological indicators of ecological health and water quality has been conducted. A data base containing all water quality data pertaining to the reference water bodies has been developed. Summary statistics of various water quality parameters are being provided for each ecoregion. This contract is being executed jointly with another contract in the same EPA project. The other project includes extensive field sampling. Although there was a delay due to the 2005 hurricane season, the project has resumed and will be completed.

## **Louisiana State Surface Water Quality Conference 2007**

The LDEQ worked with The University of Louisiana at Lafayette (ULL) to plan, organize, and conduct the Louisiana Nonpoint Source Water Quality Conference, which was held in October of 2007. ULL acted on behalf of LDEQ to invite researchers, the public and governmental staff that are involved in nonpoint source projects and have programs or projects that could be coordinated with NPS projects to accomplish water quality goals of the NPS Management Plan. There were 160 registered attendees at the conference.

The purpose of Louisiana's Nonpoint Source Water Quality Conference was to discuss the current status of the state's NPS Management Program with state and local entities, who can assist LDEQ with watershed and statewide implementation. It also provided an opportunity to share and exchange information on progress made in improving water quality within Louisiana. The conference also increased public awareness of water quality problems that exist and explained how the watershed management strategy can be utilized to improve these problems and restore water quality within Louisiana. The results of recent NPS projects were presented in order to inform the public and government cooperators what types of programs are being supported by Section 319 funds.

# Appendix B

## **Maintenance and Support for LDEQ Nonpoint Source Pollution Website**

In 2005 ESRI developed the current LDEQ Nonpoint Source Website, <http://nps.ldeq.org/wqa>. The objective of the nonpoint website was to provide the public with an internet-based application that provides a user-friendly approach for obtaining information related to LDEQ's Nonpoint Source Pollution 319 projects, implementation plans, and links to the LDEQ's GIS center for mapping information.

In this project, which is beginning in late 2007, ESRI will continue to provide support for the maintenance of the nonpoint website. Two days of support training will be provided by ESRI for updating data, links, documents, and web pages related to the Nonpoint Source Pollution website. ESRI will also provide 185 hours of support for the maintenance and enhancements of the current ArcIMS application.

## **The Relationships Between Nutrients, D.O. Conditions, Habitat, and Fish Assemblage Composition in Louisiana Streams**



Picking Fish from Seine

This project is currently being implemented is scheduled to end in 2008. Hypoxia (DO levels less than 2.0 ppm) has probably been a periodic if not pervasive condition affecting fish assemblages in many Louisiana streams for centuries. The central questions focus on whether DO conditions in streams on the 303(d) list have deteriorated as Louisiana land use patterns have changed, and if so, what are the relative contributions of natural and anthropogenic factors to hypoxic conditions, how can anthropogenic impacts be mitigated, and what effects have hypoxic conditions had on resident stream biota.

This project will involve the monitoring of water quality, habitat, and fish community structure in 16 Louisiana streams that have historically received minimal impacts from anthropogenic activities. These data will provide information on seasonal variability in stream oxygen

dynamics and whether DO conditions are related to the structure of the resident fish communities.

It is hypothesized that low-DO conditions in many Louisiana streams are caused by high rates of breakdown of allochthonous organic material from riparian vegetation, low current velocities, and warm temperatures during the extended growing season. If DO depressions in these streams are problematic to the resident biota, one would expect impacts on the abundance of more sensitive fishes, and changes in community dominance and diversity. Alternatively, if periodic hypoxia does not represent a significant impact on reproduction, foraging, and growth, then one would expect similar community composition (at least at the level of functional groups or Order/Family, if not the same set of species) across stream systems.